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TRADE NAME	MODEL	SET AND FOLDER No.
Admiral	16R11, 16R12, 26R11, 26R12, 26R25A, 26R26A, 26R35A, 26R36A, 26R37A (Ch. 21B1), 26X55A, 26X56A, 26X57A, 26X65A, 26X66A, 26X67A, 26X75A, 26X76A, (Ch. 21D1), 29X25A, (Ch. 21H1), 36R37, 36R45, 36R46 (Ch. 21C1 & Radio Ch. 5D2), 39X17C, 39X25A, 39X26A, (Ch. 21J1), 39X35, 39X36, 39X37, (Ch. 21J1 & Radio Ch. 3C1) Tel. Rec.	118-2
Aircastle	5015.1	118-3
Airline	84HA-3010A, B, C Tel. Rec. Prod. Chge. Bul. 11	118-1
Crestwood	CP-201 Recorder	118-4
DeWald	DT-162, DT-163, DT-190, ET-140, ET-141, Tel. Rec.	118-5
Emerson	671B (Ch. 120137-B)	118-6
Firestone	4-A-85, 4-A-89	118-7
General Electric	400, 401, 411	118-8
RCA Victor	2T51, 2T60 (Ch. KCS-45, A) Tel. Rec. Prod. Chge. Bul. 11	118-1
Silvertone	112 (Ch. 478.289) Tel. Rec.	118-9
Stewart-Warner	9106A, B, 9108A, B, 9109A, B, 9113A Tel. Rec.	118-10
Zenith	H2328EZ, RZ, H2352RZ, H2353EZ (Ch. 23H22Z) Tel. Rec.	118-11

SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 2, SET #94

AIRLINE MODELS
84HA3010A, B, C

A number of production changes, circuit changes, and improvements have been made to Models 84HA-3010A, B, C, since the original productions. These changes are listed below. Whenever applicable these changes may be made on sets which have not been changed in production.

IMPROVED HORIZONTAL SYNC.

A 47MFD (C93) capacttor added between pin 2 and 4 of V18, the 6SN7 horizontal oscillator tube.

GREATER WHITE TO BLACK RATIO

A 2.2KΩ ½ watt resistor (R105) added in series with junction of C53 and R40 and peaking coil. See partial schematic below. R40 changed 4.7Ω to 2.2KΩ.

IMPROVED HORIZONTAL LINEARITY

If a non-correctable bulge appears on the left hand side of test pattern install a 20K to 30 K 10 watt resistor between pin 4 (or 6) and 8 of V19 the 5V4 damper tube.

IMPROVED DEFINITION AND FOCUS

A470 MMF capacitor (C51) was added and connected in parallel with R39 the cathode resistor for V10 the 2nd video amplifier. Install this capacitor if not in the set.
Improved range of the focus control may be obtained by removing R92, 1800Ω resistor.

INCREASE SENSITIVITY

Increased sensitivity on the high-band channels may be obtained by removing the ground leads from socket terminal 4 of V1 and socket terminal 7 fo V2 and grounding these leads directly to chassis. When the above change is made C15 and C22 should also be removed.

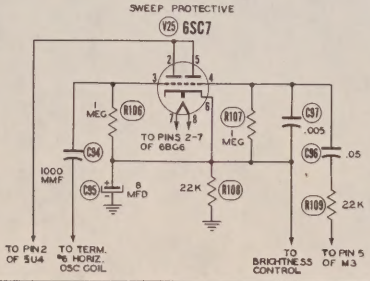
REDUCTION OF 4.5MC HASH IN PICTURE

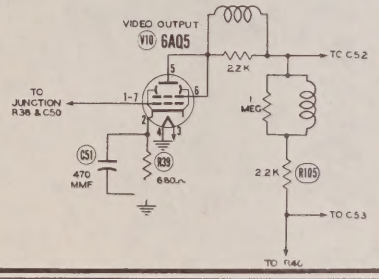
4.5 MC signal hash in the picture may be reduced by installing a 1½"x 4" metal shield between the ratio detector transformer (L30) and the tuner chassis. The ratio detector coil slug also should be grounded.

PICTURE TUBE PROTECTIVE CIRCUIT

After these sets reached the field a picture tube protective circuit was made available for installation on these sets. The purpose of this circuit is to protect the picture tube in case of failure of the horizontal or vertical sweep circuits. This prevents burning a line into the face of the picture tube.
Components in this circuit are assembled on a small sub-chassis which becomes a part of the power supply unit. A partial schematic below shows the protector unit.
In addition to the components added to the power supply chassis, the following changes were also made in the receiver chassis.

R65 in series with the brightness control, changed from 47KΩ to 150KΩ.
The 22KΩ, 2 watt cathode resistor (R108) in the protector unit replaces R66 in the receiver chassis, therefore R66 is no longer used.





SUPPLEMENTAL DATA TO PHOTOFACT FOLDER 11, SET #111

RCA VICTOR MODELS 2T51, 2T60
(Ch. KCS45, KCS45A)

C32 changed to .01MFD.
A 680Ω resistor added in parallel with C25.
A .01 MFD capacitor added in parallel with C68.
A .0015 MFD capacitor connected from the junction of R76 and the TV-Phono switch to ground.
R38 changed to 1800Ω.
R44 changed to 18KΩ.
A 36 microhenries peaking coil (part #76011) added in parallel with R44.
When R38 and R44 are changed and the peaking coil added, the frequency to which L24 (A 10) is tuned is changed to 22.5MC and L26 (A9) is changed to 24.35MC.
R45 changed to 6800Ω.
R51 changed to 560KΩ.
C101 changed to .018MFD.
R98 changed to 10KΩ.
The low side of R51 removed from ground and connected to pin 2 of V9 the DC restorer tube.

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PHOTOFACT* Folder

*TRADE MARK

ADMIRAL CHASSIS 21B1, 21C1, 21D1, 21H1, 21J1, AND RADIO CHASSIS 5D2

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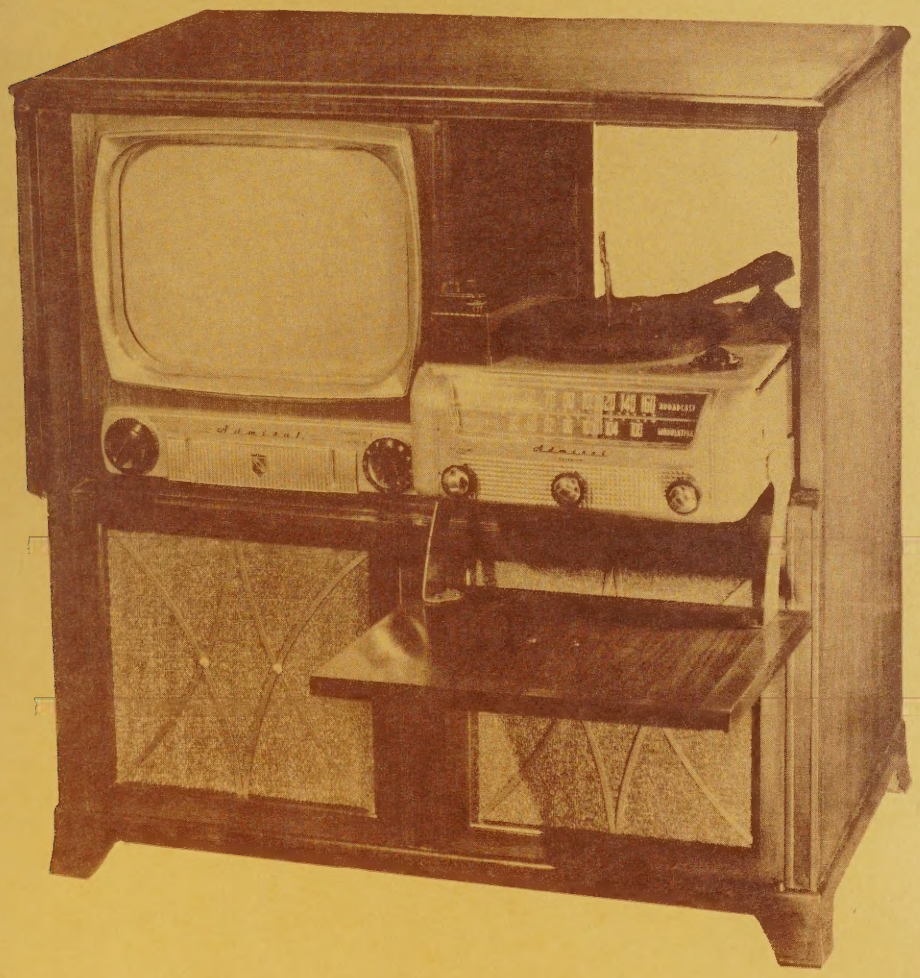
Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL 36R45

ADMIRAL CHASSIS 21B1, 21C1, 21D1, 21H1, 21J1, AND RADIO CHASSIS 5D2

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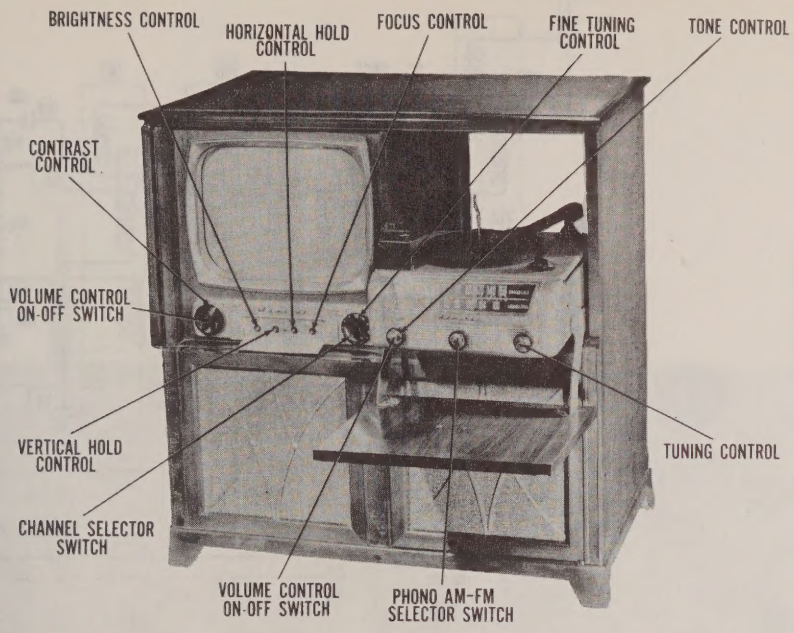
Date 12/50 Set No. 118—Folder No. 2

ADMIRAL CHASSIS 21B1, 21C1, 21D1, 21H1, 21J1 and Radio Ch. 5D2



TRADE NAME	Admiral	MODELS	TV CHASSIS	RADIO CHASSIS
		16R11, 16R12	21B1	
		26R11, 26R12, 26R25A, 26R26A, 26R35A, 26R36A, 26R37A	21B1	
		26X55A, 26X56A, 26X57A, 26X65A, 26X66A, 26X67A, 26X75A, 26X76A	21D1	
		29X25A	21H1	
		36R37, 36R45, 36R46	21C1	5D2
		39X17C, 39X25A, 39X26A	21J1	
		39X35, 39X36, 39X37	21J1	3C1

MANUFACTURER	Admiral Corp., 3800 Cortland St., Chicago 47, Illinois
TYPE SET	TV-AM-FM-Phono Combination Receiver (Some models "TV Only" and some models "TV-AM Only")
TUBES	Twenty One (TV Only Models) Twenty Four (TV-AM Only Models) Twenty Six (TV-AM-FM Models)
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATINGS	1.6 Amp. at 117 Volts AC (TV Operation), 1.2 Amp. at 117 Volts AC (Radio Operation)
TUNING RANGE	TV-Channels 2 thru 13, FM- 88-108MC, AM-540-1620KC

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RECORD CHANGER UNIT - ADMIRAL MODEL RC-550
FOR SERVICE INFORMATION ON RADIO CHASSIS 3C1 SEE PHOTOFACT SET #117 FOLDER # 2.

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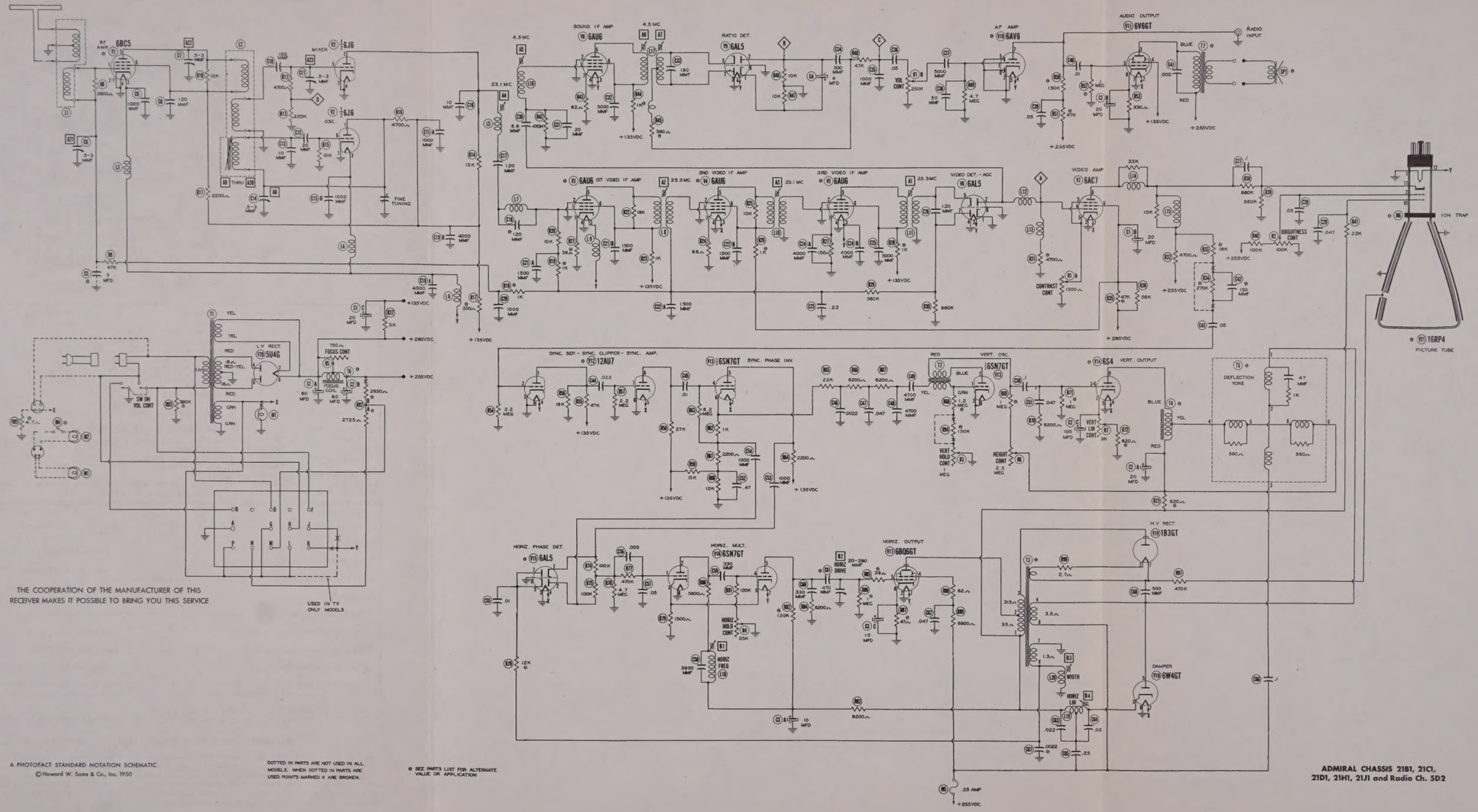

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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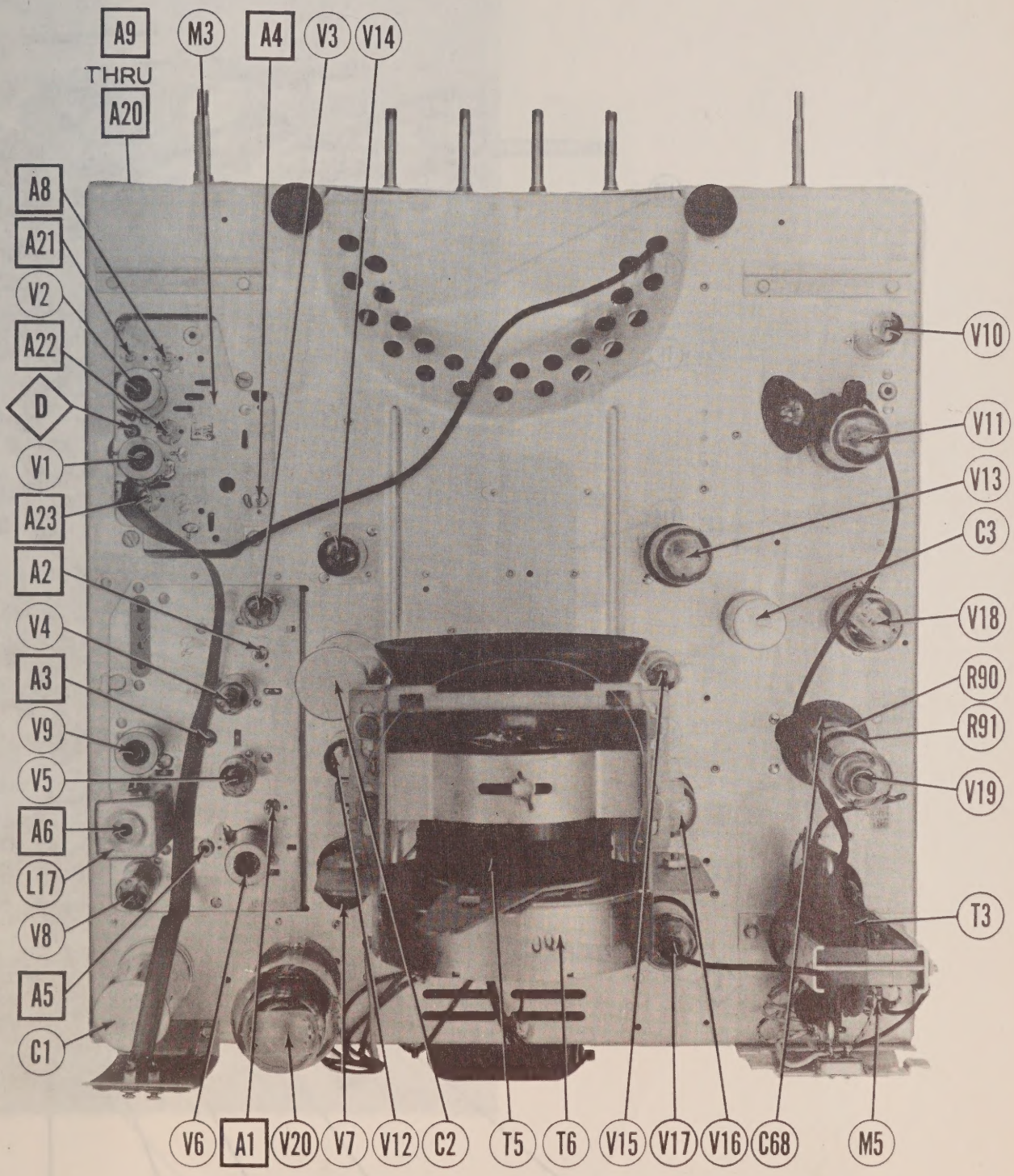
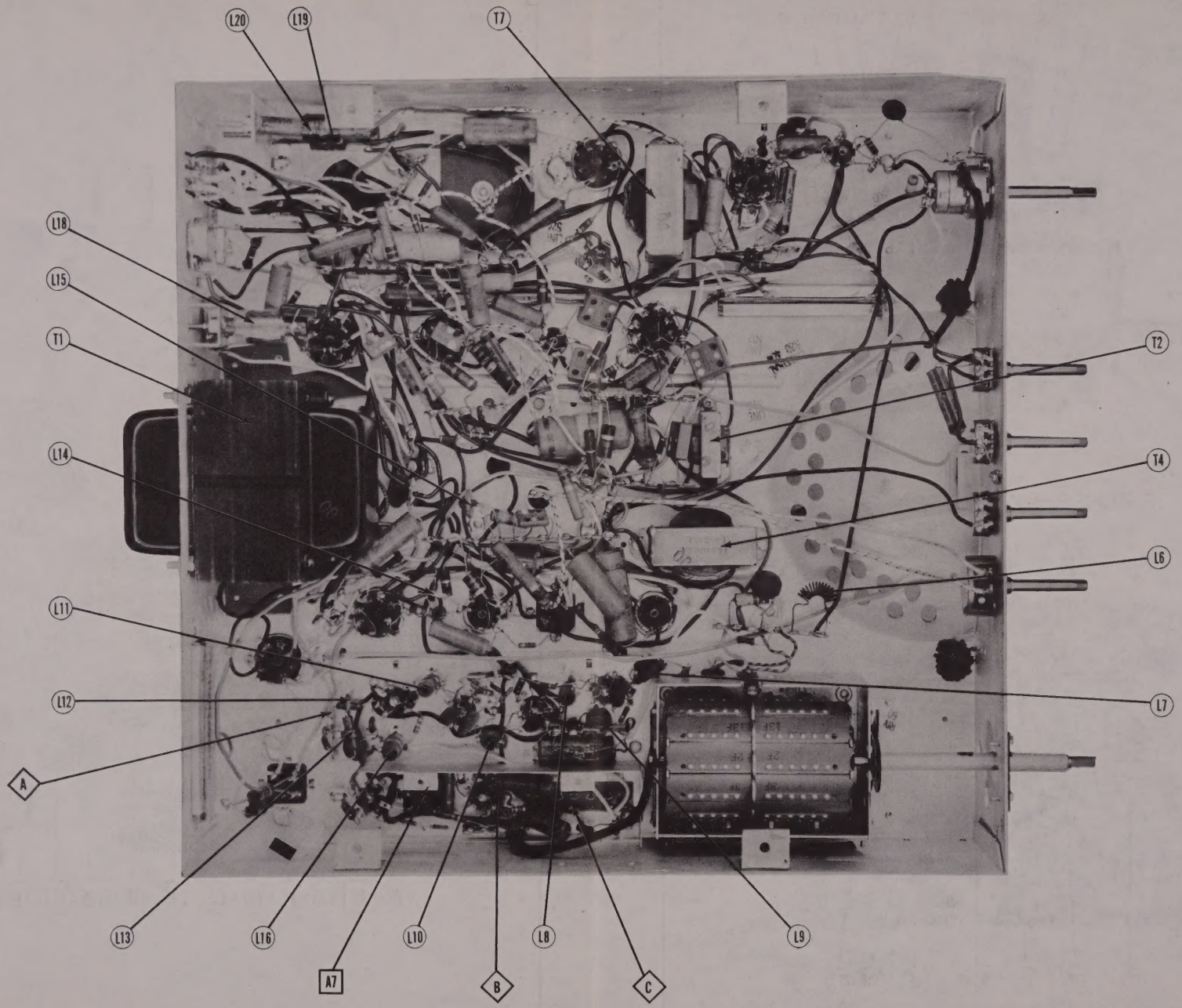
⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

ADMIRAL CHASSIS 21B1, 21C1, 21D1, 21H1, 21J1 and Radio Ch. 5D2

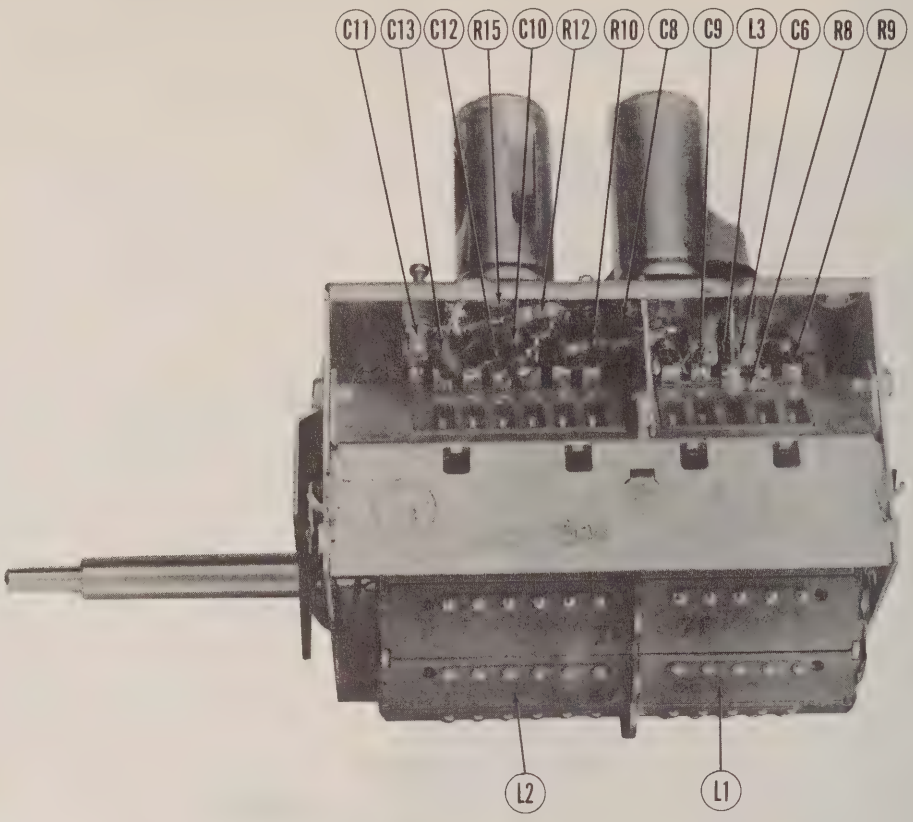
ADMIRAL CHASSIS 21B1, 21C1, 21D1, 21H1, 21J1 and Radio Ch. 5D2



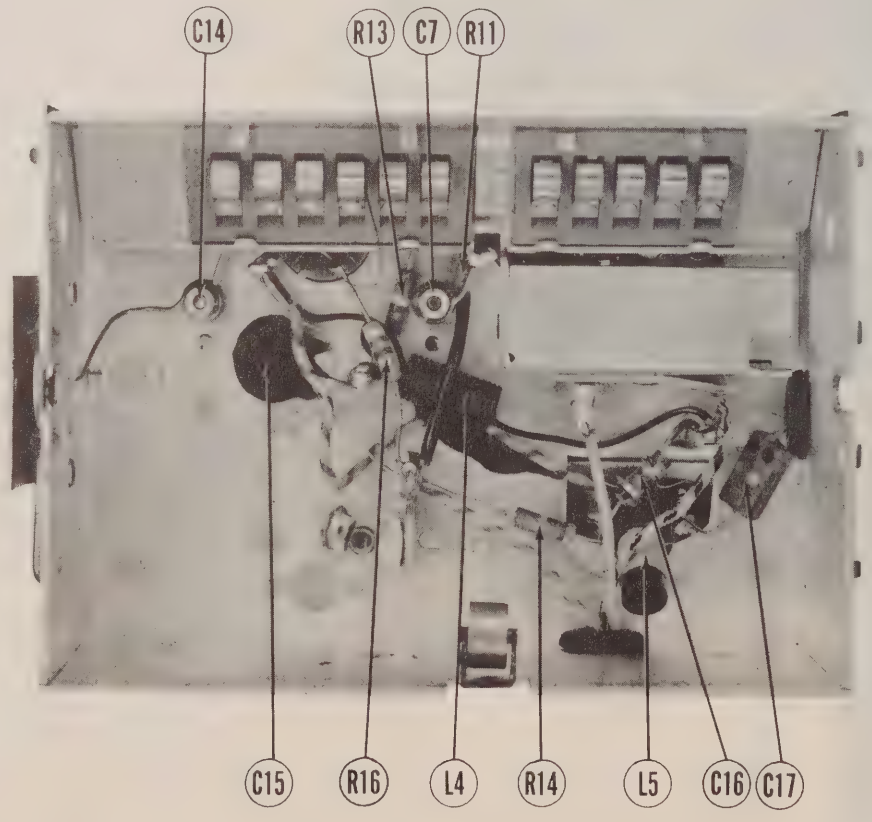
CHASSIS TOP VIEW



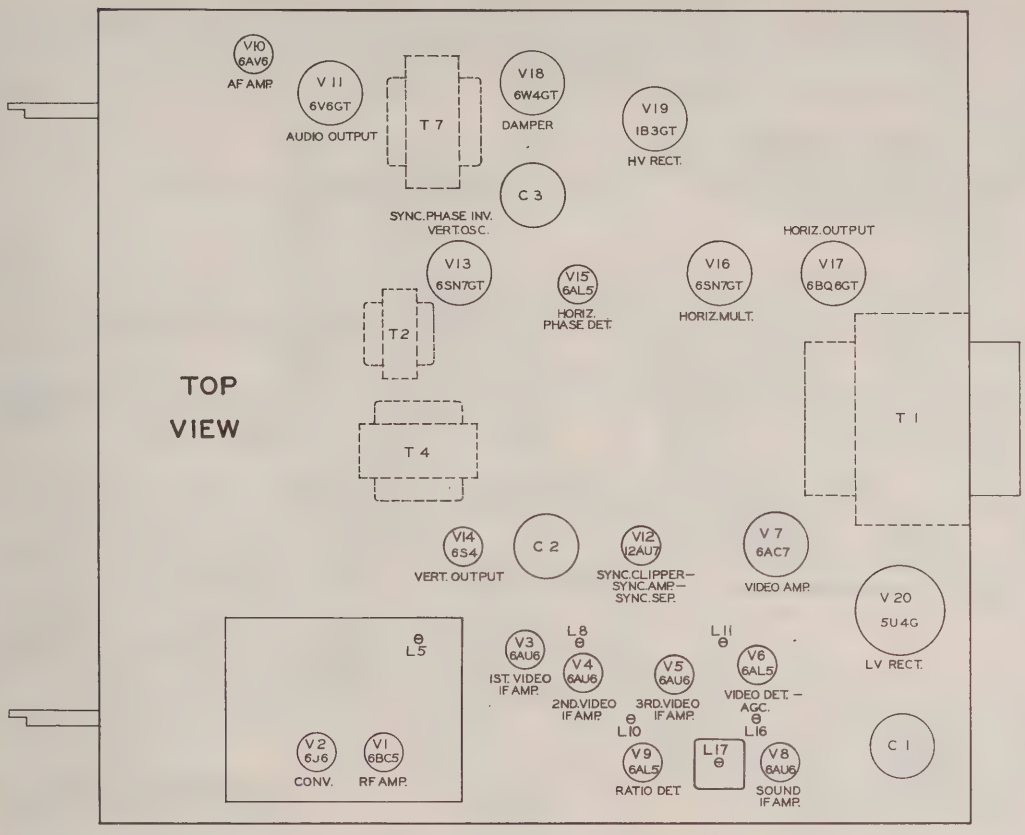
CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

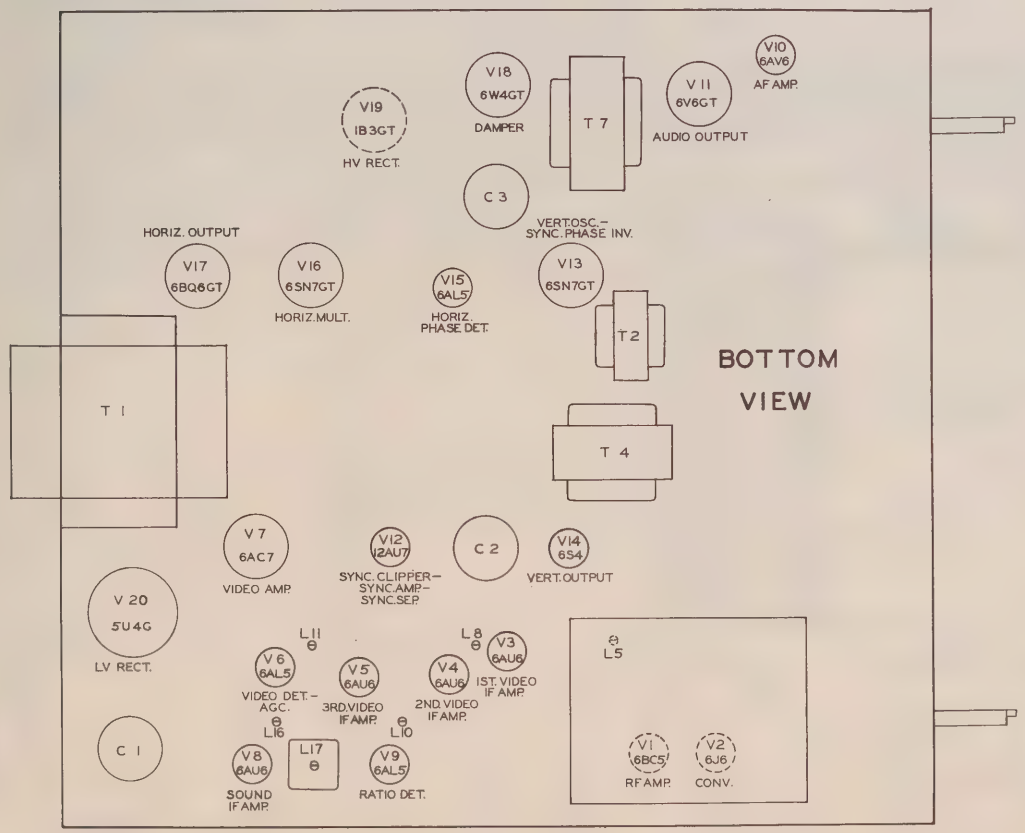


RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW





TUBE PLACEMENT CHART

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

If the set is to be aligned with the picture tube removed, the end of the high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube, or the horizontal output tube to disable the high voltage. On those models which have a radio it will be necessary to short pins Land K on the interconnecting cable socket, if the radio chassis is not plugged in.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace it with a 6J6 which has pin 1 removed. This will disable the local oscillator and prevent the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	25.3MC (Unmod.)	Any	DC Probe to Point (A). Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	Direct	"	23.1MC	"	"	A3, A4,	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	25MC (10MC Swp.)	25.75MC 24.3MC 22.0MC 21.25MC	Any	Vert. amp. to point (A) Low side to chassis.		Check for response curve similar to fig. 1. If necessary retouch A1, A2, A3, and A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.01MFD	High side to alignment point A. Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B) Commom to chassis.	A5, A6	Adjust for maximum deflection.
5.	.01MFD	"	"	"	DC Probe to Point (C) Common to chassis	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.01MFD	High side to alignment point A. Low side to chassis.	4.5MC (450KC swp)	4.5MC	Any	Vert. Amp. to Point (B) Low side to chassis.	A5, A6	Disconnect stabilizor capacitor C4. Adjust for maximum amplitude and symmetry as per fig. 2.
5.	.01MFD	"	"	"	"	Vert. Amp. to Point (C) Low side to chassis.	A7	Reconnect capacitor C4. Adjust A7 so 4.5 MC occurs at center of crossover lines as per fig. 3. Slightly retouch A6 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove tne dummy converter tube and replace the original 6J6 in its socket.

Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A8. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A8 will not bring all channels within the range of the fine tuning control, it will be necessary to adjust the individual channel oscillator adjustment screw for each channel that is off frequency. The individual channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the selector is turned to each channel.

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25 MC 215.75MC	13	Vert. Amp. to Point (A) Low side to chassis.	A9	Adjust to place sound marker as shown in fig. 4. The video marker should be at 50%.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A10	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A11	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A12	
			189MC (10MC SWP)	183.25MC 191.75MC	9		A13	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A14	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A15	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A16	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A17	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A18	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A19	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A20	

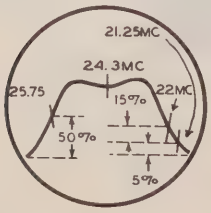


FIG. 1

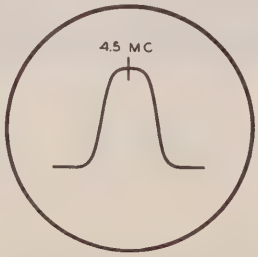


FIG. 2

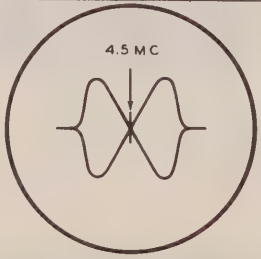


FIG. 3

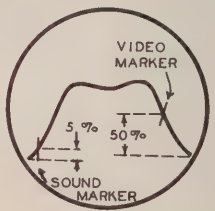


FIG. 4

TV ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp.)	205.25MC 209.75MC	12	Vert. Amp. to Point (D) Low side to chassis.	A21, A22, A23	Adjust for response curve similar to fig. 5 with markers above 90%.
8.	Two 120Ω carbon resistors.	"	213MC (10MC Swp.)	211.25MC 215.75MC	13			Check all channels for response similar to fig. 5. If markers fall below 70% on any channel, make slight adjustment of A21, A22, and A23 with channel selector set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10 MC Swp.)	199.25MC 203.75MC	11			
			195MC (10MC Swp.)	193.25MC 197.75MC	10			
			189MC (10MC Swp.)	187.25 MC 191.75 MC	9			
			183MC (10 MC Swp.)	181.25 MC 185.75MC	8			
			177MC (10MC Swp.)	175.25MC 179.75MC	7			
			85MC (10MC Swp.)	83.25MC 87.75MC	6			
			79MC (10MC Swp.)	77.25MC 81.75 MC	5			
			69MC (10MC Swp.)	67.25MC 71.75MC	4			
			63MC (10MC Swp.)	61.25MC 65.75MC	3			
			57MC (10MC Swp.)	55.25MC 59.75MC	2			

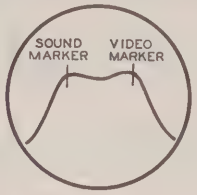


FIG. 5

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set pointer to last reference mark at low frquency end of dial.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
9.	.01MFD	High side to pin 7 (grid) of 12AT7 (V22). Low side to chassis.	455KC (400% Mod.)	AM (center)	Tuning gang fully open.	Across voice coil.	A24, A25, A26, A27	Adjust for maximum output.
10.		Loop	1620KC	"	"	"	A28	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
11.		Loop	1400KC	"	Tune for max. output	"	A29	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
12.	.01MFD	High side to pin 7 (grid) of 12AT7 (V22). Low side to chassis.	10.7MC (Unmod.)	FM (clockwise	Tuning gang fully open	DC Probe to Point (E) Common to chassis.	A30, A31, A32, A33, A34	Adjust for maximum deflection.
13.	.01MFD	"	"	"	"	DC Probe to Point (F) Common to chassis.	A35	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Continue with step 15.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
12.	.01MFD	High side to pin 1 (grid) of 6BA6 (V23). Low side to chassis.	10.7MC 450KC Swp.	FM clockwise	Point of non-interference	Vert. Amp. to Point (E) Common to chassis,	A30, A31, A32	Disconnect stabilizer capacitor C69. Adjust for maximum amplitude and symmetry as per fig. 6.
13.	.01MFD	High side to pin 7 (grid) of 12AT7 (V22). Low side to chassis	"	"	"	"	A33, A34	"
14.	.01MFD	"	"	"	"	Vert. Amp. to Point (F) Low side to chassis	A35	Reconnect capacitor C69. Adjust A35 so 10.7MC occurs at center of crossover lines as per fig. 7. Slightly retouch A30 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

Replace the dial on the radio and check the pointer setting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
15.	Two 120Ω carbon resistors.	High side thru 120Ω to ungrounded "FM" antenna terminal. Low side thru 120Ω to grounded "FM" and terminal.	108MC (Unmod.)	FM	108MC	DC Probe to Point (E) Common to chassis.	A36	Adjust for maximum output.
16.	Two 120Ω carbon resistors	"	98MC	"	Tune for max. deflection	"	A37	Adjust for maximum output.

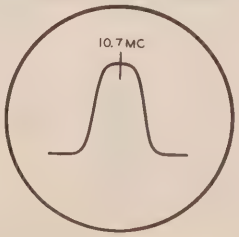


FIG. 6

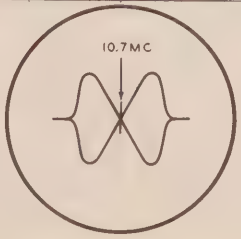


FIG. 7

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	-1VDC	0V	6.3VAC	0V	105VDC	105VDC	0V		
V 2	6J6	95VDC	85VDC	6.3VAC	0V	-2.3VDC	§-6.7VDC	0V		
V 3	6AU6	-1VDC	0V	6.3VAC	0V	130VDC	130VDC	.3VDC		
V 4	6AU6	-.7VDC	0V	6.3VAC	0V	120VDC	120VDC	.5VDC		
V 5	6AU6	0V	0V	6.3VAC	0V	125VDC	125VDC	1.3VDC		
V 6	6AL5	0V	-.6VDC	6.3VAC	0V	0V	0V	-2.2VDC		
V 7	6AC7	0V	0V	2.4VDC	-.6VDC	2.4VDC	125VDC	6.3VAC	250VDC	
V 8	6AU6	-1.6VDC	0V	6.3VAC	0V	125VDC	125VDC	.8VDC		
V 9	6AL5	.4VDC	-.4VDC	0V	6.3VAC	0V	0V	0V		
V 10	6AV6	-1VDC	0V	0V	6.3VAC	0V	0V	100VDC		
V 11	6V6GT	0V	6.3VAC	250VDC	135VDC	0V	205VDC	0V	7.2VDC	
V 12	12AU7	25VDC	-1.7VDC	0V	6.3VAC	6.3VAC	85VDC	-3.2VDC	0V	0V
V 13	6SN7GT	-20VDC	190VDC 95VDC	0V	1.5VDC	130VDC	70VDC	6.3VAC	0V	
V 14	6S4	0V	26VDC 14VDC	0V	6.3VAC	0V	0V	0V	0V	350VDC
V 15	6AL5	0V	0V	0V	6.3VAC	.2VDC	0V	.2VDC		
V 16	6SN7GT	0V	270VDC	12VDC	-5.3VDC	155VDC	12VDC	6.3VAC	0V	
V 17	6BQ6GT	-23VDC	0V	0V	165VDC	-23VDC	275VDC	6.3VAC	5.3VDC	TOP CAP *
V 18	6W4GT	0V	0V	390VDC	0V	250VDC	0V	6.3VAC	0V	
V 19	1B3GT	* DO NOT MEASURE								
V 20	5U4G	0V	280VDC	0V	290VAC	0V	290VAC	0V	280VDC	
V 21	16RP4	0V	0V	PIN 10 380VDC	PIN 11 80VDC	PIN 12 6.3VAC				

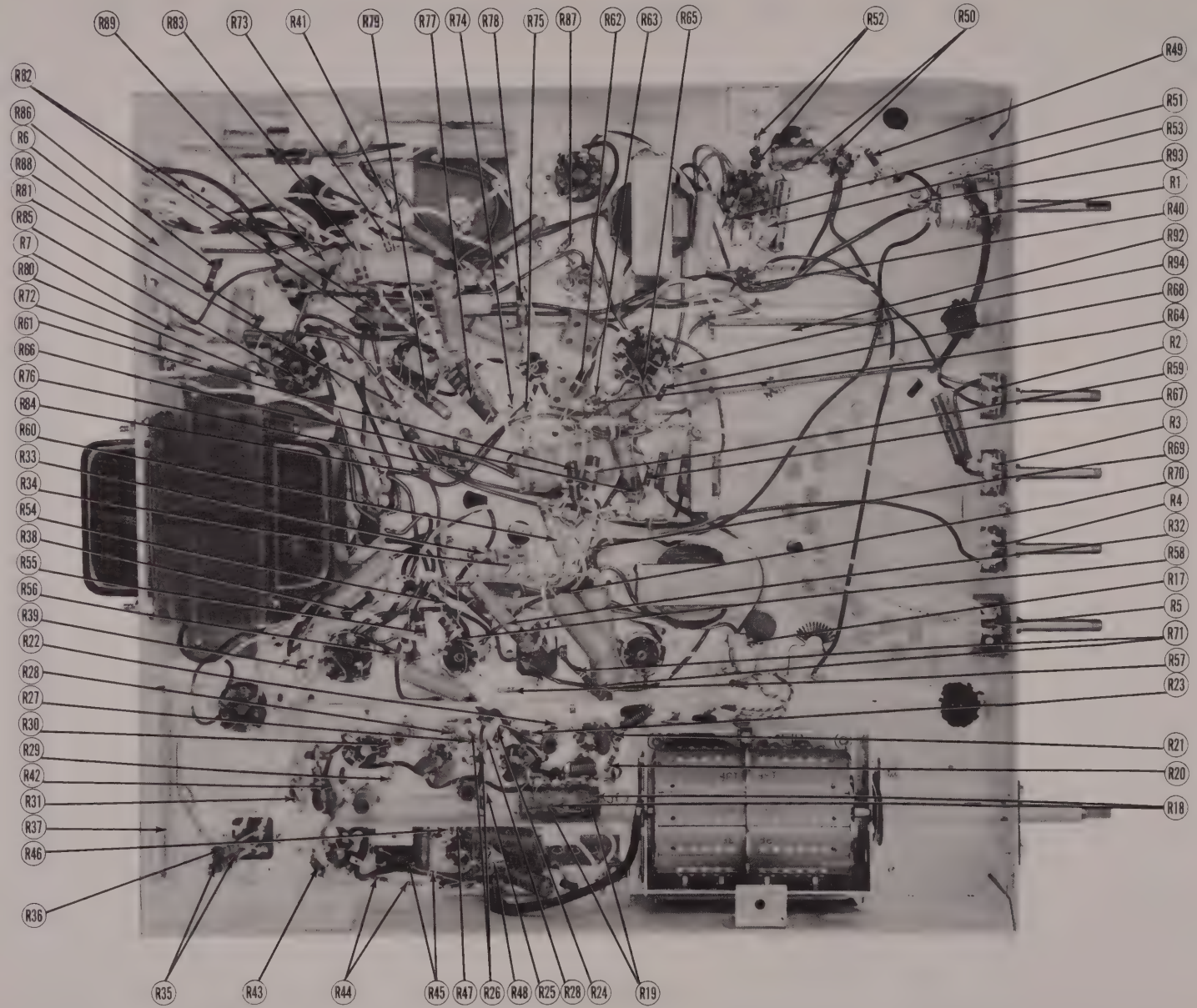
$ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT MEASURE

RESISTANCE READINGS

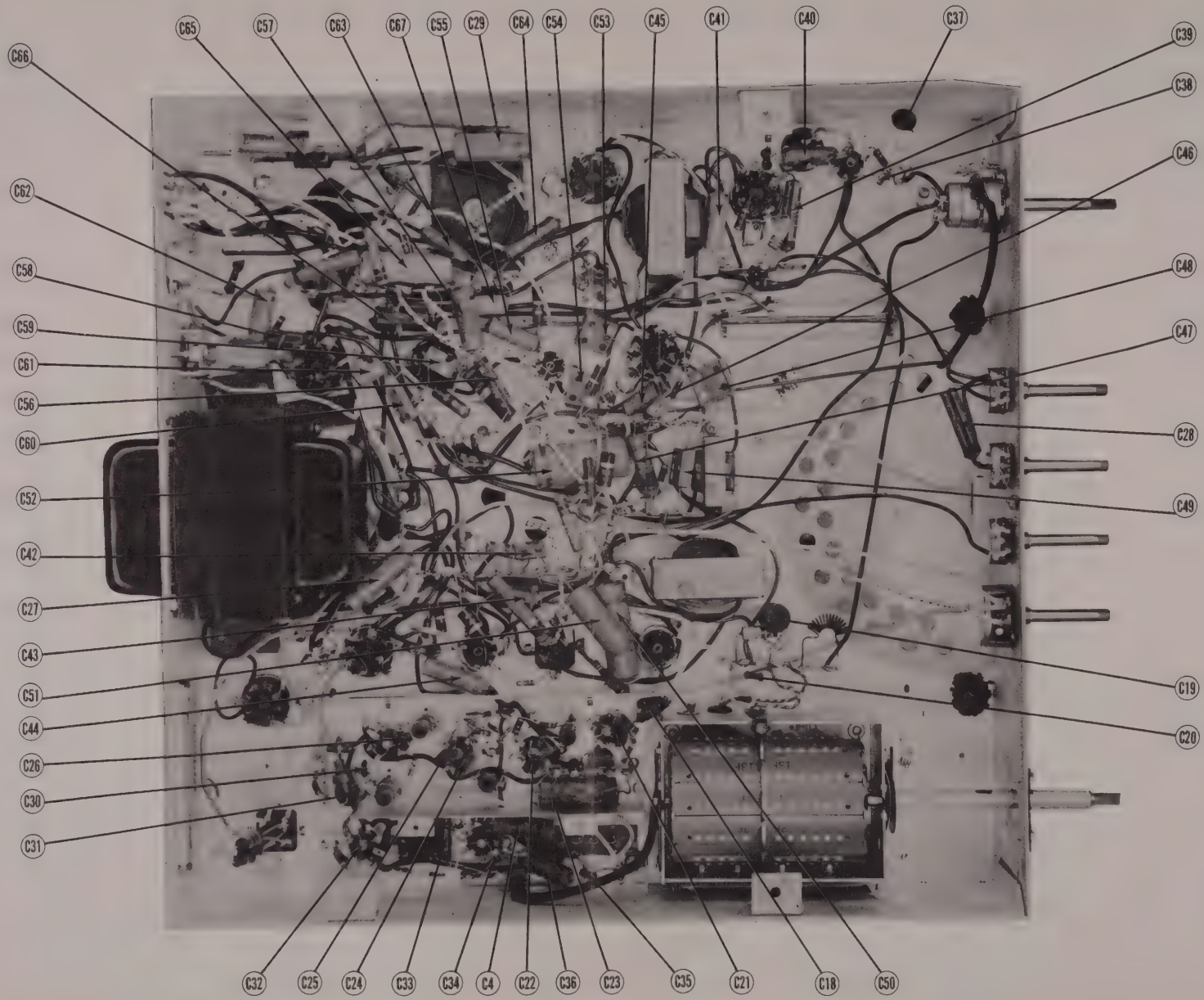
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	1.2 Meg.	0Ω	.1Ω	0Ω	†5.7KΩ	†5.7KΩ	0Ω		
V 2	6J6	†8.2KΩ	†18KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AU6	1.2 Meg.	0Ω	.1Ω	0Ω	†4KΩ	†4KΩ	39Ω		
V 4	6AU6	1.2 Meg.	0Ω	.1Ω	0Ω	†23KΩ	†23KΩ	68Ω		
V 5	6AU6	.4Ω	0Ω	.1Ω	0Ω	†4KΩ	†4KΩ	150Ω		
V 6	6AL5	0Ω	4.7KΩ	.1Ω	0Ω	.4Ω	0Ω	680KΩ		
V 7	6AC7	0Ω	0Ω	1.5KΩ	4.7KΩ	1.5KΩ	†22KΩ	.1Ω	†4.9KΩ	
V 8	6AU6	470KΩ	0Ω	.1Ω	0Ω	†4KΩ	†4KΩ	82Ω		
V 9	6AL5	10KΩ	10KΩ	0Ω	.1Ω	Inf.	0Ω	Inf.		
V 10	6AV6	4.7 Meg.	0Ω	0Ω	.1Ω	0Ω	0Ω	†200KΩ		
V 11	6V6GT	Inf.	.1Ω	†455Ω	†3KΩ	1 Meg.	†47KΩ	0Ω	330Ω	
V 12	12AU7	†25KΩ	2.2 Meg.	0Ω	.1Ω	.1Ω	†28KΩ	2.2 Meg.	0Ω	0Ω
V 13	6SN7GT	2.3 Meg.	# 1 Meg. #3.5Meg.	0Ω	8.2 Meg.	†5KΩ	15KΩ	.1Ω	0Ω	
V 14	6S4	Inf.	3.8KΩ 820Ω	1 Meg.	.1Ω	0Ω	1 Meg.	Inf.	Inf.	#2.4KΩ
V 15	6AL5	4.8 Meg.	4.8 Meg.	0Ω	.1Ω	12KΩ	0Ω	12KΩ		
V 16	6SN7GT	5.2 Meg.	#14KΩ	1.5KΩ	145KΩ	#160KΩ	1.5KΩ	.1Ω	0Ω	
V 17	6BQ6GT	1 Meg.	0Ω	Inf.	†7KΩ	1 Meg.	#14KΩ	.1Ω	47Ω	TOP CAP #42Ω
V 18	6W4GT	Inf.	Inf.	70KΩ	Inf.	†180Ω	Inf.	.1Ω	0Ω	
V 19	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #355Ω
V 20	5U4G	Inf.	20KΩ	Inf.	16Ω	Inf.	16Ω	Inf.	20KΩ	
V 21	16RP4	0Ω	0Ω	PIN 10 #22KΩ	PIN 11 320KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 8 OF V20
# MEASURED FROM PIN 3 OF V18

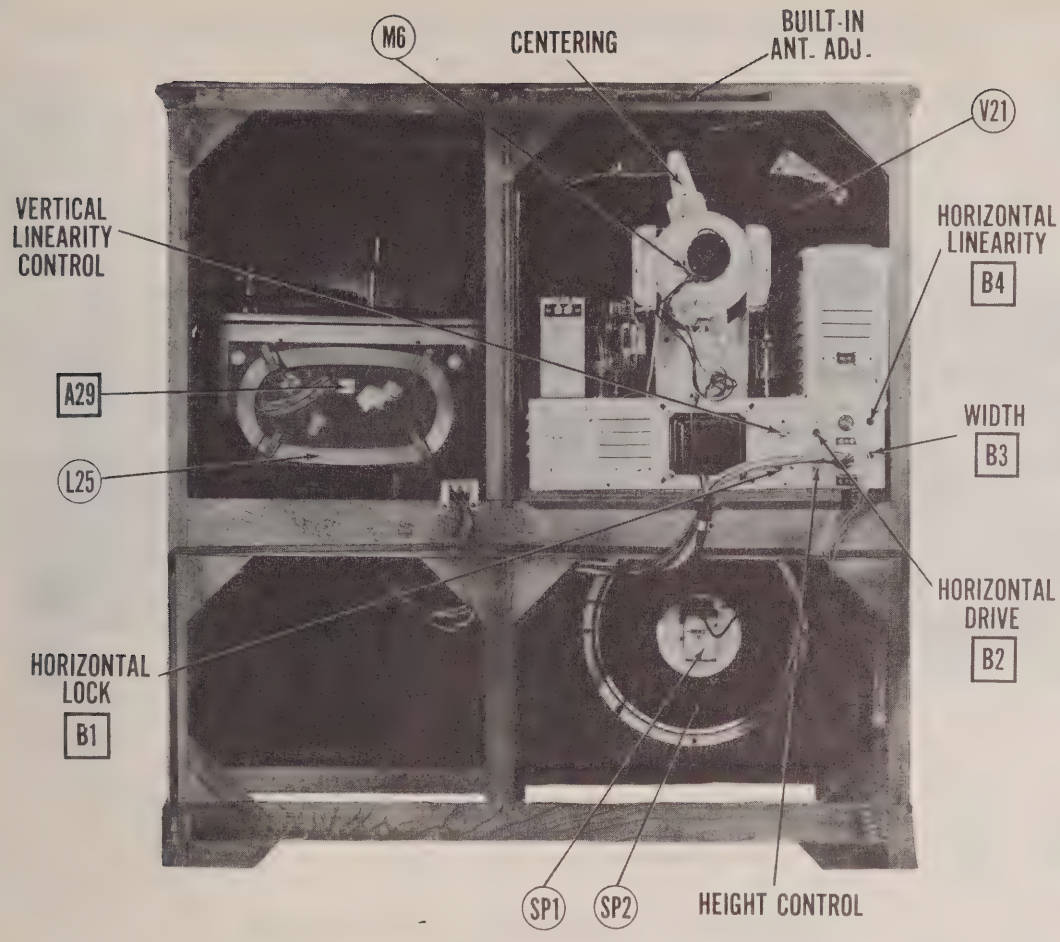
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

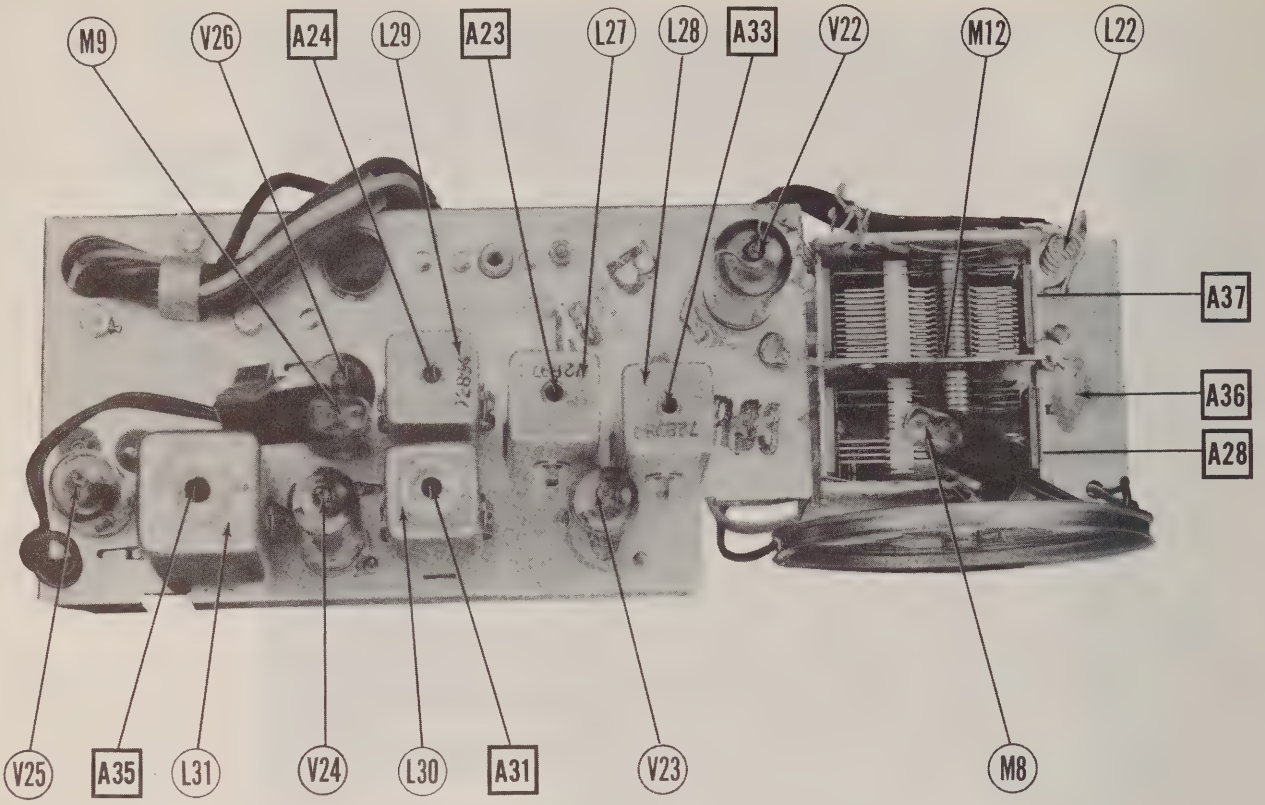


CABINET-REAR VIEW

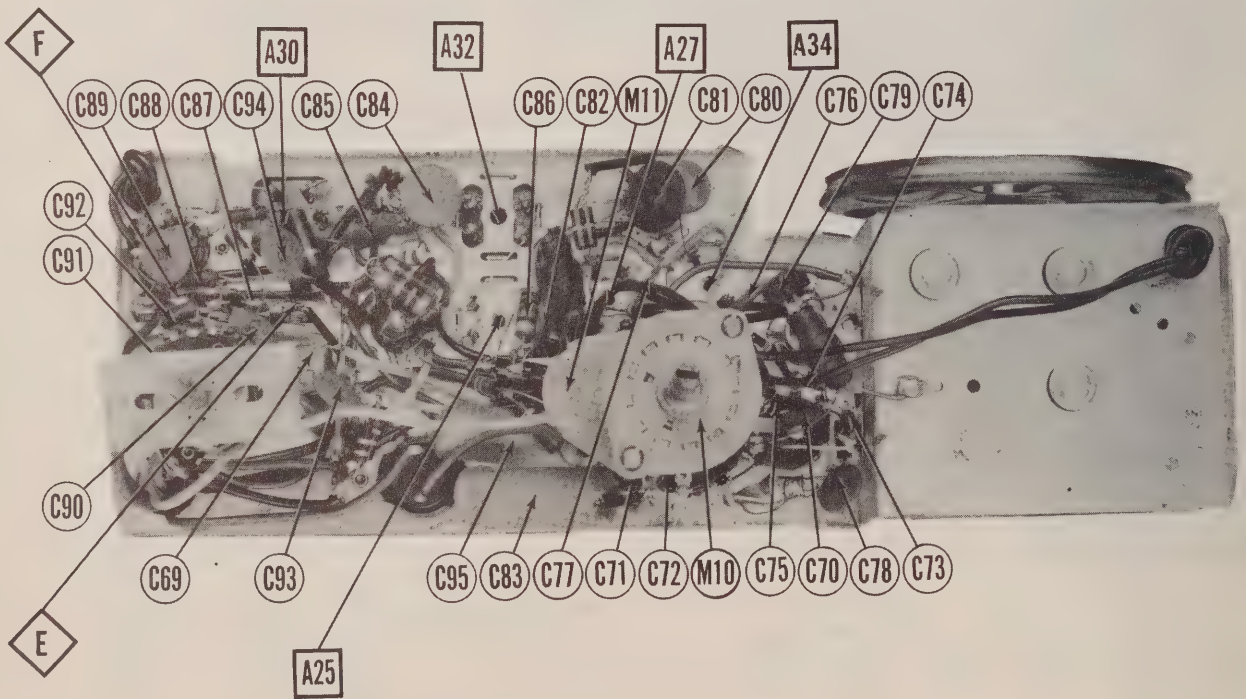
HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal hold control to maximum counter-clockwise. Note: In some early models, the wiring to the hold control was reversed. If difficulty is experienced with the horizontal oscillator adjustment, try turning the hold control to maximum clockwise.
Turn the horizontal lock slug (B1) counter-clockwise until the picture falls out of sync and then clockwise, until the picture just synchronizes.
Check to see that the picture will remain in synchronization for at least 1/2 rotation of the hold control.
Turn the channel selector switch to an unused channel, and set the brightness control to slightly less than normal.
Turn the horizontal hold control to fully counter-clockwise.
Adjust the horizontal drive trimmer (B2) counter-clockwise until one, or more, vertical lines appear in the picture.
Then, turn B2 clockwise just far enough to make the lines disappear. Do not use B2 to adjust the width or linearity of the picture.
Turn the channel switch back to a TV station.
Adjust the width slug (B3) until the picture fills the mask horizontally.
Adjust the horizontal linearity slug (B4) until the picture is symmetrical from left to right.

DIAL CORD STRINGING



RADIO CHASSIS-TOP VIEW



RADIO CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

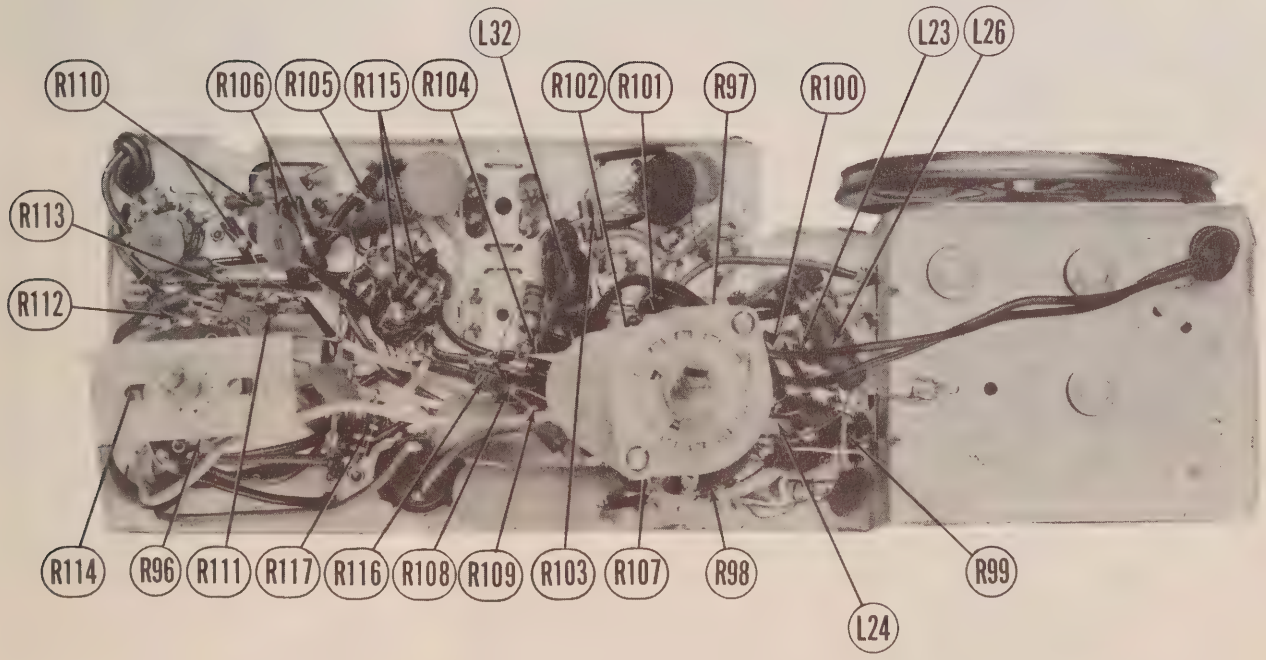
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ADMIRAL PART No.	MEISSNER PART No.	
L21	FM Ant.	0Ω		AB195		
L22	FM Ant. Coil	0Ω		69A85		
L23	FM Osc. Coil	0Ω		69A87		
L24	FM Peaking	16Ω		73A5-11		Wound on 820Ω resistor
L25	Loop Ant.	1.3Ω		69C116-1		
L26	AM Osc. Coil	7Ω		69A86-1		
L27A	1st AM IF			72B97-1		Late production
B	1st AM IF	3.1Ω	6Ω	72B97	16-6758	Early production
L28A	1st FM IF			72B98-1		Late production
B	1st FM IF	.1Ω	.5Ω	72B98		Early production
L29	2nd AM IF	8.5Ω	8.5Ω	72B94	16-6758	
L30	2nd FM IF	3Ω	.1Ω	72B76		
L31	Ratio Det. Trans.	2Ω	.2Ω	72B39		
L32	Fil. Choke	0Ω	0Ω	69A102		

DIAL LIGHTS

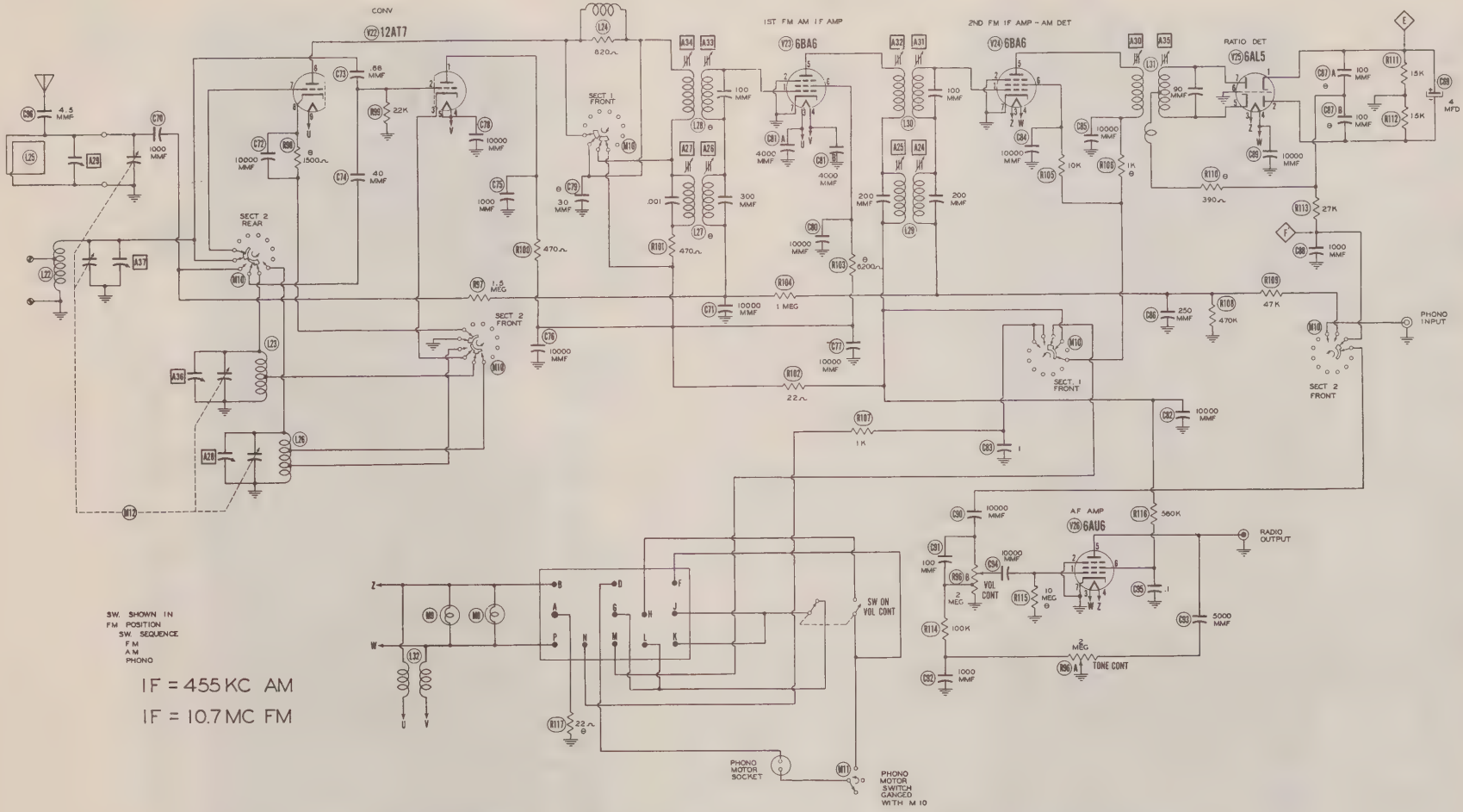
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA ADMIRAL PART No.		NOTES
M8	Bayonet	6-8	.15	Brown	81A1-8		Type #47
M9	Bayonet	6-8	.15	Brown	81A1-8		Type #47

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M10	Switch	76B22	Function (Includes phono motor switch)
M11	Switch	76B23	Phono motor
M12	Tuning Cap	68B24	
	Knob	33D55-1	Radio-Phono, Tuning
	Knob	33D55-4	Radio volume
	Knob	33D55-5	Tone



RADIO CHASSIS-RESISTOR IDENTIFICATION



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V22	12AT7	9155VDC ▲140VDC	89-2 8VDC 8▲-7.8VDC	0V	6.3VAC	6.3VAC ▲140VDC	9160VDC ▲140VDC	-80V ▲-.3VDC	93VDC ▲2.8VDC	0V
V23	6BA6	-.8VDC	0V	0V	6.3VAC	9180VDC ▲140VDC	9115VDC ▲105VDC	0V		
V24	6BA6	9-.8VDC ▲-.8VDC	0V	0V	6.3VAC	9145VDC ▲0V	9105VDC ▲0V	0V		
V25	6AL5	9.5VDC	9-7VDC	0V	6.3VAC	-80V	0V	90V		
V26	6AU6	-.9VDC	0V	6.3VAC	0V	9175VDC ▲185VDC	35VDC	0V		

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V22	12AT7	93.3KΩ ▲7KΩ	22KΩ	84Ω ▲1.9Ω	.1Ω	.1Ω	93.3KΩ ▲7KΩ	80Ω ▲ 3 Meg.	1.5KΩ	0Ω
V23	6BA6	1.5 Meg.	0Ω	0Ω	.1Ω	89.8KΩ ▲98.5KΩ	89.4KΩ ▲113KΩ	0Ω		
V24	6BA6	470KΩ	0Ω	0Ω	.1Ω	93.8KΩ ▲ Inf.	93.8KΩ ▲ Inf.	0Ω		
V25	6AL5	18KΩ	18KΩ	0Ω	.1Ω	Inf.	0Ω	Inf.		
V26	6AU6	10 Meg.	0Ω	.1Ω	0Ω	1200KΩ	81563KΩ ▲1588KΩ	0Ω		

● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

‡ TAKEN WITH VACUUM TUBE VOLTMETER

↑ TAKEN IN FM POSITION
▲ AM POSITION

† MEASURED FROM PIN 8 OF V26

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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ADMIRAL CHASSIS 21B1, 21C1, 21D1, 21H1, 21J1 and Radio Ch. 5D2

RADIO SCHEMATIC

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ADMIRAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amp.	6BC5	6BC5	7BD	
B	RF Amp.	6CB6	6CB6	6CK	
C	RF Amp.	6AG5	6AG5	7BD	
V2	Converter	6J6	6J6	7BF	
V3A	1st Video IF	6AU6	6AU6	7BK	
B	1st Video IF	6AG5	6AG5	7BD	
V4A	2nd Video IF	6AU6	6AU6	7BK	
B	2nd Video IF	6AG5	6AG5	7BD	
V5A	3rd Video IF	6AU6	6AU6	7BK	
B	3rd Video IF	6AG5	6AG5	7BD	
V6	Video Det. -AGC	6AL5	6AL5	6BT	
V7	Video Amp.	6AC7	6AC7	8N	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Ratio Det.	6AL5	6AL5	6BT	
V10A	AF Amp.	6AV6	6AV6	7BT	
B	AF Amp.	6SQ7	6SQ7	8Q	
V11	Audio Output	6V6GT	6V6GT	7AC	
V12A	Sync. Sep. -Sync. Clipper-Sync. Amp.	12AU7	12AU7	9A	
B	Sync. Sep. -Sync. Clipper-Sync. Amp.	6SN7GT	6SN7GT	8BD	
V13	Sync. Phase Inv. - Vert. Osc.	6SN7GT	6SN7GT	8BD	
V14A	Vert. Output	6S4	6S4	9AC	
B	Vert. Output	6SN7	6SN7	8BD	
V15A	Hor. Phase Det.	6AL5	6AL5	6BT	
B	Hor. Phase Det.	6H6	6H6	7Q	
V16	Hor. Mult.	6SN7GT	6SN7GT	8BD	
V17	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V18	Damper	6W4GT	6W4GT	4CG	
V19	HV Rect.	1B3GT	1B3GT	3C	
V20	LV Rect.	5U4G	5U4G	5T	
V21A	Picture Tube	16RP4	16RP4	12D	
B	Picture Tube	16TP4	16TP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	60	400	67C15-17	AFH12I44H		UPT62245			▲ Filter
B	20	350							■ Decoupling
C	20	350							▲ Decoupling
C2A	20	450	67C15-18	AFH4J16H20B		UPT317			▲ Decoupling
B	80	350							■ Filter
C	100	50							▲ Vert. Output Cath.
C3A	10	450	67C15-19	AFH22J4A		UP1045C		TVL-3737	■ Decoupling
B	20	25				BR102A			▲ Output Cath. Byp.
C	10	25							Hor. Output Cath.
C4	4	50	67A4-9	PRS150/4		BBR4-50T		TVA-1303	Stabilizing Cap.
C5	5		98A45-22	SI5NPO	TCZ-4.7		NPOK-5		Fixed Trimmer *
C6	.5-3		98A45-87		829-3				Variable Trimmer
C7	.5-3		98A45-23		829-3				Variable Trimmer
C8	120		98A45-25	SI120	D6-121		GP2K-120	19C29	RF Amp. Dec.
C9	1000		98A45-24	SI1000	D6-102		GP2L-001	19C1	RF Amp. Fil.
C10	100		98A45-26	SI100N750	TCN-100		GP1K-100	29C16	RF Coupling
C11	.5-3		98A45-23		829-3				Variable Trimmer
C12	20		98A45-27	SI20NPO	TCZ-20		NPOK-20		Osc. Grid Cap.
C13	10		98A45-79	SI10N750	TCN-10		N750K-10	19C4	Fixed Trimmer
C14	.5-3		98A45-23		829-3				Variable Trimmer
C15A	1000		98A45-24	BPD-2 x 001	DD-2-102		882-2 x 0015	29C7	RF Bypass
B	1000		98A45-24						Conv. Fil. Byp.
C16	10		98A45-64	SI10NPO	TCZ-10		NPOK-10	19C3	Fixed Trimmer
C17	120	500	98A45-78	SI120	D6-121		GP2K-120	19C29	IF Coupling
C18	120	500	65B1-10		TCZ-120		NPOM-120		Fixed Trimmer †
C19A	4000		65A17-1	BPD-2 x 004	DD-2-502	1D5D4	882-2 x 004	36C2	Filament Bypass
B	4000					1D5D4			RF Bypass
C20	1000		65B6-41	SI1000	D6-102	1W5D1	GP2L-001	19C1	AGC Filter
C21A	1500		65A17-2	BPD-2 x 0015	DD-2-152	1W5D15	882-2 x 0015	29C6	AGC Filter
B	1500					1W5D15			1st V. IF Dec.
C22A	1500		65A17-2	BPD-2 x 0015	DD-2-152	1W5D15	882-2 x 0015	29C6	AGC Filter
B	1500					1W5D15			2nd V. IF Dec.
C23	.22	200	64B8-37	P488-22		GT2P25		2TM-P22	AGC Filter
C24A	4000		65A17-1	BPD-2 x 004	DD-2-502	1D5D4	882-2 x 004	36C2	3rd V. IF Cath.
B	4000					1D5D4			3rd V. IF Fil.
C25	5000		65A10-1	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Dec.
C26	120		65B6-66	SI120	D6-121	5W5T15	GP2K-120	19C29	IF Coupling
C27	.1	400	64B5-20	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C28	.05	400	64B9-28	P488-05	DF-503	PTE4S5		4TM-S5	Pic. Tube Grid
C29	.047	600	64B8-9	P688-047	DF-503	PTE6S5		6TM-S47	Acc. Anode Bypass
C30	6.8		65B6-71	SI6.8NPO	TCZ-6.8		NPOK-6.8		S. IF Coupling
C31	20		65B6-51	SI20NPO	TCZ-20	5R5Q2	NPOK-20	MS-42	Voltage Divider
C32	5000		65A10-1	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Coupling
C33	180		65B6-59		TCN-180		N750L-180		Fixed Trimmer
C34	500		65B6-6	SI500	D6-501	5W5T5	GP2K-500	19C32	Diode Load Cap.
C35	1000		65B6-41	SI1000	D6-102	1W5D1	GP2L-001	19C1	De-emphasis
C36	.05	200	64B9-41	P288-05	DF-503	PTE4S5		2TM-S5	Audio Coupling
C37	5000		65A10-1	BPD-005	DD-502	1D5D5	811-005	29C1	Audio Coupling
C38	50		65B6-4	SI50	D6-500	5W5Q5	GP1K-50	19C28	AF Amp. Grid
C39	.05	400	64B9-28	P488-05	DF-503	PTE4S5		4TM-S5	AF Amp. Plate Dec.
C40	.01	400	64B5-25	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Audio Coupling
C41	.002	600	64B5-12	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Output Plate Byp.
C42	150	500		1468-00015	D6-151	5W5T15	GP1K-150	1FM-315	Sync. Coupling *
C43	.05	400	64B9-28	P488-05	DF-503	PTE4S5		4TM-S5	Sync. Coupling
C44	.022	400	64B5-24	P488-022	DF-203	PTE4S2		4TM-S22	Sync. Coupling
C45	.01	400	64B5-25	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Sync. Coupling
C46	.0022	600	64B5-14	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Integrator Net.
C47	.005	600	64B5-12	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net.
C48	4700	500	65B21-472	1467-005	D6-472	1D5D5	GP2M-0047	1FM-25	Integrator Net.
C49	4700	500	65B21-472	1467-005	D6-472	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid Cap.
C50	.1	600	64B5-5	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C51	.047	600	64B8-9	P688-047		PTE6S5		6TM-S47	Vert. Discharge
C52	.47	400	64B9-72	P488-47		GT4P5		4TM-P5	Sync. Phase Inv. Dec.

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C53	1000	500	65B21-102	1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C54	1000	500	65B21-102	1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C55	.01	400	64B5-23	P488-3	D6-103	PTE4S1	811-01	4TM-S1	Integrator Net.
C56	.005	600	64B5-12	P488-05	D6-502	PTE6D5	811-005	6TM-D5	AFC Filter
C57	.05	400	64B5-24	P488-05	DF-503	PTE4S5		4TM-S5	AFC Filter
C58	3900	500	65B1-63	1464-004		1DR5D4		MS-24	Fixed Trimmer
C59	330	500	65B21-331	1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	Hor. MV Feedback
C60	330	500	65B21-331	31330	D6-331	5W5T3	GP2K-330	1FM-335	Hor. Discharge
C61	470	500	65B21-471	1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	Hor. Sweep Coupling ‡
C62	.047	600	64B5-7	P688-047	DF-503	PTE6S5		6TM-S47	Hor. Output Screen
C63	.022	400	64A2-9	P488-022	DF-203	PTE4S2		4TM-S22	Damper Filter
C64	.05	200	64A2-8	P488-05	DF-503	PTE4S5		2TM-S5	Damper Filter
C65	.25	600	64B5-3	684-25		GT6P25		6TM-P25	Damper Filter
C66	.1	400	64A2-10	P488-1	DF-104	PTE4P1		4TM-P1	Hor. Sweep Coupling
C67	.0022	600	64B9-11	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Fixed Trimmer †
C68	500	20000	65B18-5	HV20C	TV3-502				HV Filter

* Not used in all models.
† Used in late production models.
‡ Used in chassis 21C1 after run 2. In some 21D1, 21H1 and 21J1 chassis a .004MFD capacitor is used, part No. 64B8-15.
‖ Chassis 21D1 uses 330MMF in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1500Ω	½	75B11-16		RTV-214	SBB-580-S	Contrast control-front
B	250KΩ	½			—		Volume control and switch-rear
R2A	100KΩ	½	75B13-12	Q11-128	AG-49-S	AN-40	Brightness control
B	Shaft		Not Req.	Not Req.	RS-2	AK-4	Attach to R2A per instructions
R3A	1 Meg.	½	75B13-14	Q11-137	AG-81-S	AN-69	Vert. hold control
B	Shaft		Not Req.	Not Req.	RS-2	AK-4	Attach to R3A per instructions
R4A	25KΩ	½	75B13-13	Q11-120	AG-40-S	AN-26	Horiz. hold control
B	Shaft		Not Req.	Not Req.	RS-2	AK-4	Attach to R4A per instructions
R5	750Ω	2	75B13-16				Focus control-Wire Wound
R6A	2.5 Meg.	½	75B13-3	Q11-239	AG-84-S	AN-83	Height control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	3000Ω	½	75B13-7	Q11-112	AG-15-S	B-8	Vert. linearity control
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Attach to R7A per instructions

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R8	3900Ω	½	98A45-16	BTS-3900	Antenna Coil Shunt
R9	47KΩ	½	98A45-17	BTS-47K	AGC Network
R10	10KΩ	½	98A45-18	BTS-10K	RF Plate Coil Shunt
R11	2200Ω 20%	½	98A45-19	BTS-2200	RF Decoupling
R12	4700Ω	½	98A45-20	BTS-4700	Converter Grid
R13	220KΩ 20%	½	98A45-21	BTS-220K	Converter Grid
R14	15KΩ	½	98A45-67	BTS-15K	Converter Plate
R15	10KΩ	½	98A45-18	BTS-10K	Osc. Grid
R16	4700Ω	½	98A45-20	BTS-4700	Osc. Plate
R17	500Ω	1		BTA-470	Decoupling- See Note 1
R18	1000Ω 20%	½	60B8-102	BTS-1000	AGC Network-See Note 2
R19	1000Ω 20%	½	60B8-102	BTS-1000	AGC Network-See Note 2
R20	10KΩ 5%	½	60B7-103	BTS-10K-5%	1st Video IF Grid
R21	39Ω	½	60B8-390		1st Video IF Cathode-See Note 3
R22	18KΩ	½	60B8-183		2nd Video IF Transformer Shunt
R23	1000Ω	½	60B8-102	BTS-1000	1st Video IF Decoupling
R24	68Ω	½	60B8-680		2nd Video IF Cathode
R25	10KΩ 5%	½	60B7-103		3rd Video IF Transformer Shunt
R26	1000Ω 20%	½	60B8-102	BTS-1000	2nd Video IF Decoupling-See Note 2
R27	150Ω	½	60B8-151	BTS-150	3rd Video IF Cathode
R28	1000Ω 20%	½	60B8-102	BTS-1000	3rd Video IF Decoupling-See Note 2
R29	560KΩ	½	60B8-564	BTS-560K	AGC Network
R30	680KΩ 20%	½	60B8-684	BTS-680K	AGC Rect. Diode Load
R31	4700Ω 5%	½	60B7-472	BTS-4700-5%	Video Det. Diode Load-See Note 2
R32	4700Ω	2	60B20-472	BTS-4700	Video Amp. Plate
R33	18KΩ	½	60B8-183	BTS-18K	Isolation-See Note 4
R34	270KΩ	½	60B8-274	BTS-270K	Isolation-See Note 5
R35	47KΩ	2	60B20-473	BTS-47K	Decoupling-See Note 6
R36	56KΩ	2	60B20-563	BTS-56K	Decoupling
R37	3000Ω	15	6IA3-14	2D-3000	Filter-Wire Wound
R38	680KΩ 20%	½	60B8-684	BTS-680K	Voltage Divider
R39	560KΩ	½	60B8-564	BTS-560K	Picture Tube Cathode
R40	100KΩ 20%	½	60B8-104	BTS-100K	Voltage Divider
R41	22KΩ 20%	½	60B8-223	BTS-22K	Acc. Anode Decoupling
R42	470KΩ	½	60B7-474		Sound IF Grid
R43	82Ω	½	60B8-820	BTS-82	Sound IF Cathode
R44	1000Ω 20%	½	60B8-102	BTS-1000	Sound IF Decoupling-See Note 2
R45	390Ω	½	60B8-391	BTS-390	Balancing-See Note 2
R46	10KΩ	½	60B7-103	BTS-10K	Ratio Det. Diode Load
R47	10KΩ	½	60B7-103	BTS-10K	Ratio Det. Diode Load
R48	47KΩ	½	60B8-473	BTS-47K	De-emphasis
R49	4.7 Meg. 20%	½	60B8-475	BTS-4.7 Meg.	AF Amp. Grid
R50	150KΩ	½	60B8-154	BTS-150K	AF Amp. Plate-See Notes 2 and 15
R51	47KΩ	½	60B8-473	BTS-47K	AF Amp. Plate Decoupling-See Note 16
R52	1 Meg.	½	60B8-105	BTS-1 Meg.	Audio Output Grid-See Note 2
R53	330Ω	1	60B14-331	BTA-330	Audio Output Cathode
R54	2.2 Meg.	½	60B8-225	BTS-2.2 Meg.	Sync. Sep. Grid
R55	47KΩ	1	60B14-473	BTA-47K	Sync. Sep. Plate
R56	18KΩ	½	60B8-183	BTS-18K	Voltage Divider
R57	2.2 Meg.	½	60B8-225	BTS-2.2 Meg.	Sync. Amp. Grid
R58	27KΩ	2	60B20-273	BTB-27K	Sync. Amp. Plate
R59	15KΩ	1	60B14-153	BTA-15K	Voltage Divider
R60	12KΩ	2	60B20-123	BTB-12K	Voltage Divider
R61	2200Ω	1	60B14-222	BTA-2200	Voltage Divider
R62	1000Ω	1	60B8-102	BTA-1000	Sync. Phase Inv. Cathode
R63	8.2 Meg.	½	60B8-825	BTS-8.2 Meg.	Sync. Phase Inv. Grid
R64	2200Ω	½	60B8-222	BTS-2200	Sync. Phase Inv. Plate
R65	22KΩ	½	60B8-223	BTS-22K	Integrator Network
R66	8200Ω 20%	½	60B8-822	BTS-8200	Integrator Network
R67	8200Ω 20%	½	60B8-822	BTS-8200	Integrator Network

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	IRC PART No.	IDENTIFICATION CODES
R68	1. 2 Meg.	½	60B8-125	BTS-1.2 Meg.	Vert. Osc. Grid-See Note 7
R69	1 Meg.	½	60B8-105	BTS-1 Meg.	Vert. Osc. Plate-See Note 13
R70	82000Ω 20%	½	60B8-832	BTS-8200	Vert. Peaking
R71	1 Meg.	½	60B8-105	BTS-1 Meg.	Vert. Output Grid-See Note 2
R72	820Ω	1	60B8-821	BTA-820	Vert. Output Cathode-See Note 14
R73	820Ω	½	60B8-821	BTS-820	Decoupling-See Note 2
R74	100KΩ 5%	½	60B7-104	BTS-100K-5%	Horiz. Phase Det. Load
R75	100KΩ 5%	½	60B7-104	BTS-100K-5%	Horiz. Phase Det. Load
R76	4.7 Meg.	½	60B8-475	BTS-4.7 Meg.	Horiz. Phase Det. Load
R77	470KΩ	2	60B20-474	BTB-470K	Horiz. AFC Filter Network
R78	12KΩ	2	60B20-123	BTB-12K	Feedback Network-See Note 2
R79	1500Ω	½	60B8-152	BTS-1500	Horiz. MV Cathode
R80	56000Ω 20%	½	60B8-562	BTS-5600	Horiz. MV Plate
R81	120KΩ	1	60B8-124	BTA-120K	Horiz. MV Grid
R82	150KΩ	½	60B8-154	BTS-150K	Horiz. MV Plate-See Note 2
R83	8200Ω 20%	1	60B14-822	BTA-8200	Decoupling
R84	8200Ω 20%	½	60B8-822	BTS-8200	Horiz. Peaking
R85	39Ω	½	60B8-390		Parasitic Suppressor-See Note 8
R86	1 Meg.	½	60B8-105	BTS-1 Meg.	Horiz. Output Grid-See Note 2
R87	47Ω	1	60B14-470	BW-1-47	Horiz. Output Cathode-See Note 6
R88	82Ω	½	60B8-820		Parasitic Suppressor
R89	6800Ω 20%	2	60B20-682	BTB-6800	Horiz. Output Screen
R90	2.7Ω		60B28-47		HV Rect. Filament
R91	470KΩ	1	60B14-474		HV Filter
R92A	2725	15	6IA6-8		Voltage Dropping-Wire Wound-See Note 9
B	2650				Voltage Dropping-Wire Wound
R93	390KΩ	1	60B14-394	BTA-390K	Line Filter-See Note 10
R94	150KΩ	½	60B8-154	BTS-150K	Vert. Osc. Grid-See Note 11
R95	4.7Ω	½			Series Dial Lamp-See Note 12

Note 1. Some models may use a 1000Ω resistor in this application.
Note 2. Some models may use a two resistors in series to obtain required resistance and wattage.
Note 3. Some models may use a 47Ω resistor in this application.
Note 4. Those models produced before run 2 of 21B1 chassis, and before run 5 of 21C1 chassis use a 8200Ω resistor in this application.
Note 5. Not used in models produced before run 2 of 21B1 chassis, and before run 5 of 21C1 chassis.
Note 6. Some models use two resistors in parallel to obtain required resistance and wattage.
Note 7. Those models employing a 6SN7 vert. output tube use 1.5 meg resistor in this application.
Note 8. Some model may use a 68Ω resistor in this application.
Note 9. Not used in television models only.
Note 10. Some models use 270KΩ resistor in this application.
Note 11. Used only in those models employing a 6S4 vertical output tube.
Note 12. Used in chassis 21J1 only.
Note 13. Those models employing a 6SN7 vertical output tube uses a 2.5 Meg. resistor in this application.
Note 14. Chassis 21D1 uses 680Ω resistor in this application.
Note 15. Those models produced before run 2 of 21C1 chassis uses 270KΩ in this application.
Note 16. Those models produced before run 2 of 21C1 chassis uses 150KΩ in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC	600VCT	5VAC	6.3VAC	80C26-1			TP-225
	② 1.6A	.210ADC	③ 3A	② 9.6A				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	210Ω	1100Ω	79A18-2	A-8111 ①	A-3000 ①	TBO-3 ①	Vert. Block Osc. Trans.
T3A	350Ω	3.5Ω	79C30-2 ⑦				Hor. Output Trans.
	Tap ②	SEC. 2					
	35Ω	1.3Ω					
		SEC. 3					
		0Ω					
B			79C30-3 ③				Hor. Output Trans.
T4A	1400Ω		79B29-1 ②	A-8123	A-3037		Vert. Output Trans.
	Tap ④						
	14Ω						
B			79B34-1 ③				Vert. Output Trans.
T5A	14Ω		A3222 ④	DY-7	MD-70F		Hor. Deflection Coil
	48Ω						Vert. Deflection Coil
T5B	13Ω		A3178 ⑤				Hor. Deflection Coil
	46Ω						Vert. Deflection Coil
C			A3197 ⑥				Deflection Yoke
T6A	275Ω		69C117-3 ②				Focus Coil
	Tap ④						
	100Ω						
B			69C117-4 ③				Focus Coil

① Drill one new mounting hole.
② Used in chassis 21B1, 21C1, 21H1, 21J1.
③ Used in chassis 21D1, 21E1.
④ Used in chassis 21B1, 21C1 (16" rect. pix tube)
⑤ Used in chassis 21D1, (16" round picture tube)
⑥ Used in chassis 21H1, 21J1 (19" round picture tube)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA ADMIRAL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7A	5000Ω	3.7Ω	275Ω	.5Ω	79C33-2 ⑦	A-3877 ①	A-3019 ①	RO-9	① Drill one new mounting hole.
‖					79C33-1 ⑧				⑦ Used in chassis 21C1.
									⑧ Used in chassis 21D1.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA ADMIRAL PART No.	JENSEN PART No.	QUAM PART No.	INSTALLATION NOTES
SP1A	PM	3.7Ω	78B56-2 ⑨		12A4A	⑨ Used in models, 36R37, 36R45, 36R46.
B	PM		78B59-1 ⑩			⑩ Used in models 16R11, 16R12
C	PM		78B49-1 ⑪			⑪ Used in models 26R11, 26R12, 26R35A
D	PM		78B47-2 ⑫			⑫ Used in models 26R35A, 36R36A, 36R37A
	CONE DIA.	V. C. DIA.				
SP2A	11 1/2"	3/4"				
B	5"					
C	8"					
D	10"					

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ADMIRAL PART No.	MEISSNER PART No.	NOTES
L1	Ant. Coil	0Ω	0Ω	•		• Refer misc.
L2	RF, Mixer Grid & Osc.					
	Coils	0Ω		•		• Refer misc.
L3	Fil. Choke	0Ω		98A45-13		
L4	Fil. Choke	0Ω		98A45-14		
L5	1st Video IF	1.1Ω		98A45-77		
L6	Fil. Choke	0Ω		73A2-5		
L7	Adj. Channel Trap	0Ω		72A102		Includes C18, not used in all models.
L8	2nd Video IF	.4Ω	.4Ω	72C96-6		Includes R22, R23 and C22
L9	Fil. Choke	0Ω		73A2-5		
L10	3rd Video IF	.4Ω	.4Ω	72C96-7		Includes R25
L11	4th Video IF	.4Ω	.4Ω	72C96-8		Includes C26
L12	Peaking	5.5Ω		73A5-12		
L13	Peaking	17Ω		73A5-7		
L14	Peaking	6.8Ω		73A5-13		Wound on 33KΩ resistor
L15	Peaking	7.6Ω		73A5-9		Wound on 10KΩ resistor
L16	Sound IF	5Ω		72B99-1		Includes C30, C31 and R42
L17	Ratio Det. Trans.	3.5Ω	.3Ω	72B68		
L18	Horiz. Freq. Coil	40Ω		94A17		Includes C58 and R80
L19	Horiz. Lin.	6.5Ω		94A28		
L20	Width Coil	1.2Ω		94A29-1		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA ADMIRAL PART No.	NOTES
M1	Bayonet	6-8	.15	Brown	81A1-8	Type #47
M2	Bayonet	117			81A2-4	117V 7W (Chassis 21J1 only)

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	RF Tuner	94A18-4	
M4	Switch		Phono compartment light (Chassis 21J1 only)
M5	Fuse	84A4-2	.25A 250V Type AGX
M6A	Ion Trap	94A15-1	For 16RP4 picture tube
B	Ion Trap	94A15-2	For 16TP4 picture tube
	Antenna Coil	98A62-2	Channel 2
	Antenna Coil	98A62-3	Channel 3
	Antenna Coil	98A62-4	Channel 4
	Antenna Coil	98A62-5	Channel 5
	Antenna Coil	98A62-6	Channel 6
	Antenna Coil	98A62-7	Channel 7
	Antenna Coil	98A62-8	Channel 8
	Antenna Coil	98A62-9	Channel 9
	Antenna Coil	98A62-10	Channel 10
	Antenna Coil	98A62-11	Channel 11
	Antenna Coil	98A62-12	Channel 12
	Antenna Coil	98A62-13	Channel 13
	RF, Mixer & Osc. Coils	98A63-2	Channel 2
	RF, Mixer & Osc. Coils	98A63-3	Channel 3
	RF, Mixer & Osc. Coils	98A63-4	Channel 4
	RF, Mixer & Osc. Coils	98A63-5	Channel 5
	RF, Mixer & Osc. Coils	98A63-6	Channel 6
	RF, Mixer & Osc. Coils	98A63-7	Channel 7
	RF, Mixer & Osc. Coils	98A63-8	Channel 8
	RF, Mixer & Osc. Coils	98A63-9	Channel 9
	RF, Mixer & Osc. Coils	98A63-10	Channel 10
	RF, Mixer & Osc. Coils	98A63-11	Channel 11
	RF, Mixer & Osc. Coils	98A63-12	Channel 12
	RF, Mixer & Osc. Coils	98A63-13	Channel 13
	Safety Glass	23D67	Models 36R37, 36R45 36R46
	Safety Glass	23E62	Models 39X35, 39X36 (Round holes)
	Safety Glass	23E62-1	Models 39X35, 39X36 (Oblong holes)
	Safety Glass	23D68	TV only models
	Knob	33C53-9	Channel selector
	Knob	33C53-10	Fine tuning
	Knob	33C53-11	TV volume
	Knob	33C53-12	Contrast

PHONO CARTRIDGE and NEEDLE

ITEM No.	REPLACEMENT DATA ADMIRAL PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	SHURE PART No. CARTRIDGE	SHURE PART No. NEEDLE	REMARKS
M7	409A13	AC-AG-J	A-AG	W26B	A66U	

ASTATIC AND SHURE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED.

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		ADMIRAL PART No.	STANDARD REPLACEMENT		
V22	Converter	12AT7	12AT7	9A	
V23	1st FM -AM IF Amp	6BA6	6BA6	7BK	
V24	2nd FM IF Amp. - AM Det.	6BA6	6BA6	7BK	
V25	Ratio Det.	6AL5	6AL5	6BT	
V26	AF Amp.	6AU6	6AU6	7BK	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C69	4	150	67A4-2	PRS150/4		BR415		TVA-1402	Stabilizing Cap.
C70	1000		65B6-41	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Coupling
C71	10000		65A10-3	BPD-01	DD-103	PTE4S1	811-01	36C1	AVC Filter
C72	10000		65A10-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Conv. Cath. Byp.
C73	.68		65A16-1		TCZ-.68				Osc. Coupling
C74	40		65B6-67	SI39	D6-390	5W5Q4	GP1K-39	1FM-44	Osc. Grid Cap.
C75	1000		65B6-41	SI1000	D6-102	1W5D1	GP2L-001	19C1	Osc. Plate Byp.
C76	10000		65A10-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Decoupling
C77	10000		65A10-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Decoupling
C78	10000		65A10-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Conv. Fil. Byp.
C79	30	500	65B1-69		TCZ-30	5R5Q3	NPOM-30	MS-43	Fixed Trimmer *
C80	10000		65A10-3	BPD-01	DD-103	PTE4S1	811-01	36C1	1st IF Screen
C81A	4000		65A17-1	BPD-2 x 004	DD-2-502	1D5D4	882-2 x 004	36C2	1st IF Fil.
B	4000					1D5D4			1st IF Fil.
C82	10000		65A10-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Decoupling
C83	.1	400	64B1-20	P488-1	DF-104	PTE4P1		4TM-P1	Decoupling
C84	10000		65A10-3	BPD-01	DD-103	PTE4S1	811-01	36C1	2nd IF Screen
C85	10000		65A10-3	BPD-01	DD-103	PTE4S1	811-01	36C1	2nd IF Plate Dec.
C86	250		65B6-5	SI250	D6-251	5W5T25	GP2K-250	1FM-325	AM Det. Grid Filter
C87A	100		63A7-1	SI100	D6-101	5W5T1	GP1K-100	19C11	Diode Load Cap. †
B	100			SI100	D6-101	5W5T1	GP1K-100	19C11	Diode Load Cap. †
C88	1000		65B6-41	SI1000	D6-102	1W5D1	GP2L-001	19C1	De-emphasis
C89	10000		65A10-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Ratio Det. Fil.
C90	10000		65A10-3	BPD-01	DD-103	PTE4S1	811-01	36C1	Audio Coupling
C91	100		65B6-68	SI100	D6-101	5W5T1	GP1K-100	19C11	Tone Comp.
C92	1000		65B6-41	SI1000	D6-102	1W5D1	GP2L-001	19C1	Tone Comp.
C93	5000		65A10-1	BPD-005	DD-502	1D5D5	811-005	29C1	Tone Comp.
C94	10000		65A10-3	BPD-01	DD-10S	PTE4S1	811-01	36C1	Audio Coupling
C95	.1	400	64B1-20	P488-1	DF-104	PTE4P1		4TM-P1	AF Amp. Screen
C96	45		65B6-61	SI5	TCZ-4.7	5W5V5	GP1K-5	MS-55	Ext. Ant. Coupling

* Early production models using IF transformer (part 72B98) used 40MMF in this application. Mfgr's part No. 65B1-65.
† When either items C87A or C87B are replaced, replace with capacitors of equal value.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	PART No.	IRC PART No.	CLAROSTAT PART No.		
R96A	2 Meg.	$\frac{1}{2}$	75B11-12	Concentrikit	RTV-46	SBBT-531-S	Tone control-front
B	2 Meg.			B11-139 *			Volume control-rear-tapped at 1 Meg.
C	Shaft End			B18-139X *			Attach per instr. in "Concentrikit".
D	Switch			E-202 *			Attach per instr. in "Concentrikit".
				76-2 *			

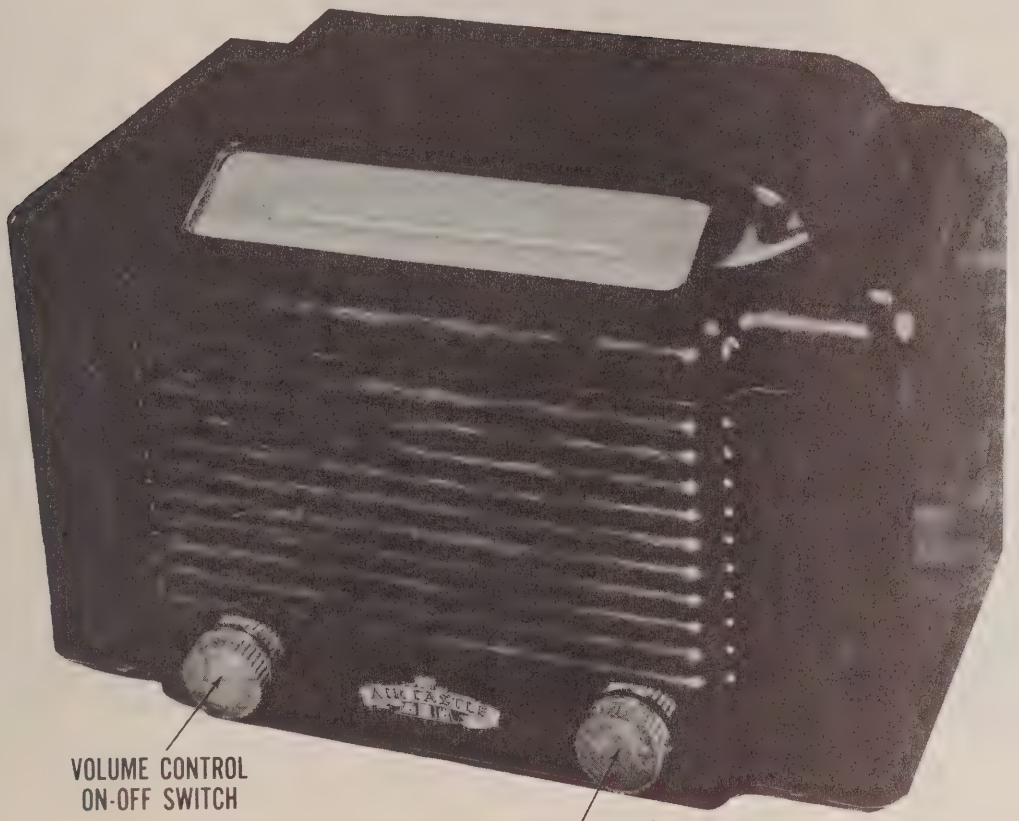
* Additional parts to be used in "Concentrikit".

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ADMIRAL PART No.	IRC PART No.	
R97	1.5 Meg.	$\frac{1}{2}$	60B8-155	BTS-1.5 Meg.	AVC Network
R98	1500Ω	$\frac{1}{2}$	60B8-152	BTS-1500	Conv. Cathode-See Note 17
R99	22KΩ	$\frac{1}{2}$	60B8-223	BTS-22K	Osc. Grid
R100	470Ω	$\frac{1}{2}$	60B8-471	BTS-470	Osc. Plate
R101	470Ω	$\frac{1}{2}$	60B8-471	BTS-470	Conv. Plate Decoupling
R102	22Ω	$\frac{1}{2}$	60B8-220	BW-$\frac{1}{2}$-22	Decoupling
R103	6200Ω	$\frac{1}{2}$	60B7-622		1st IF Screen-See Note 18
R104	1 Meg.	$\frac{1}{2}$	60B8-105	BTS-1 Meg.	AVC Network
R105	10KΩ	$\frac{1}{2}$	60B8-103	BTS-10K	2nd FM IF Screen
R106	1000Ω	$\frac{1}{2}$	60B8-102	BTS-1000	2nd FM IF Plate Decoupling-See Note 18
R117	1000Ω	1	60B14-102	BTA-1000	Decoupling
R108	470KΩ	$\frac{1}{2}$	60B8-474	BTS-470K	Diode Load
R109	47KΩ	$\frac{1}{2}$	60B8-473	BTS-47K	Diode Filter
R110	390Ω	$\frac{1}{2}$	60B8-391	BTS-390	Balancing-See Note 19
R111	15KΩ	$\frac{1}{2}$	60B8-153	BTS-15K	Ratio Det. Diode Load
R112	15KΩ	$\frac{1}{2}$	60B8-153	BTS-15K	Ratio Det. Diode Load
R113	27KΩ	$\frac{1}{2}$	60B8-273	BTS-27K	De-emphasis
R114	100KΩ	$\frac{1}{2}$	60B8-104	BTS-100K	Tone Compensation
R115	10 Meg.	$\frac{1}{2}$	60B8-106	BTS-10 Meg.	AF Amp. Grid-See Note 18
R116	560KΩ	$\frac{1}{2}$	60B8-564	BTS-560K	AF Amp. Screen
R117	22Ω	$\frac{1}{2}$	60B8-220	BW-$\frac{1}{2}$-22	Isolation-See Note 18

Note 17. Early production models uses a 240Ω resistor in this application.
Note 18. Some models use two resistors in parallel to obtain required resistance and wattage.
Note 19. Some models use two resistors in series to obtain required resistance and wattage.

AIRCASTLE
MODEL 5015.1



AIRCASTLE
MODEL 5015.1

AIRCASTLE MODEL 5015.1

TRADE NAME	Aircastle, Model 5015.1
SUPPLIER	Spiegel, Inc., 1061 W. 35th St., Chicago 9, Illinois
TYPE SET	AC-DC Operated Superheterodyne Receiver With Loop Antenna.
TUBES (FIVE)	Types 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	110-125 Volts AC-DC
RATING	.23 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1720KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low frequency end of dial. Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400Ω Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4,	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	.1MFD	"	1720KC	"	"	A5	"
3.		Loop	1400KC	Tune for max. output.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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PARTS LIST AND DESCRIPTIONS

AIRCASTLE MODEL 5015.1

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AIRCASTLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12SA7	12SA7	8R	
V2	IF Amp.	12SK7	12SK7	8N	
V3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
V4	Power Output	50L6	50L6	7AC	
V5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	150	EC-12	PRS150/40-20		EDL4215		TVA-2438	Filter Red
B	20	150							Filter Yellow
C2	.01	400	PC-7	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Antenna Coupling
C3	51		MC-8	SI50	D6-500	5W5Q5	GP1K-50	GP1K-50	Osc. Grid Cap
C4	.05	400	PC-5	P488-05	DF-503	PTE455		4TM-S5	AVC Filter
C5A	220			SI220	D6-221	5W5T25	GP2K-220		Diode RF Filter
B	2000			BPD-002	DD-202	PTE6D2	801-002	34C3	Audio Coupling
C	220			SI220	D6-221	5W5T25	GP2K-220		AF Amp. Plate
D	5000			BPD-005	DD-502	PTE6D5	811-005		Audio Coupling
C6	.01	400	PC-7	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Output Plate Bypass
C7	.1	600	PC-8	P688-1	DF-104	PTE6P1		72P52	Line Insolation
C8	.05	400	PC-5	P488-05	DF-503	PTE4S5		4TM-S5	Line Filter *
C9	.05	400	PC-5	P488-05	DF-503	PTE4S5		4TM-S5	IF Amp. Cathode *

* Not Used In All Models.

CONTROLS

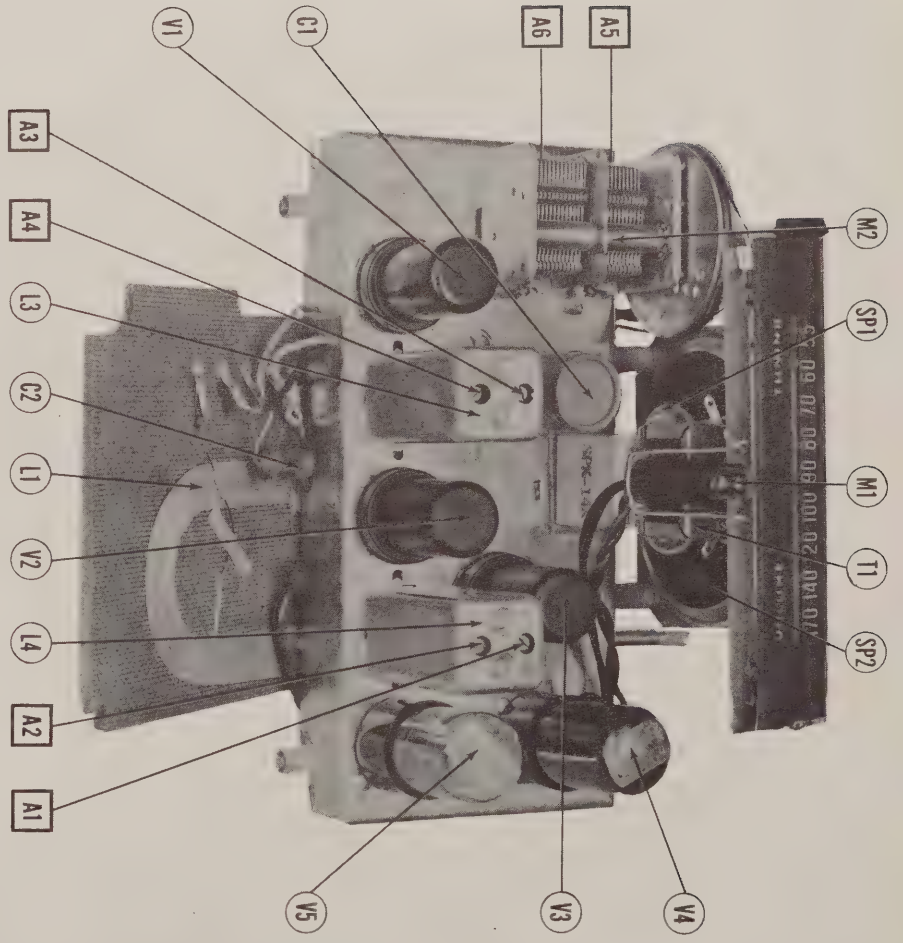
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1Meg	½	VC-4	Q13-137	AG-63-Z	BSK-70-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRCASTLE PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	½	IR-9		Osc. Grid
R3	3.3Meg	½	IR-23	BTS-3.3Meg	AVC Network
R4	330Ω	1		BTA-330	IF Amp. Cathode - See Note
R5	47KΩ	½	IR-10	BTS-47K	AVC Network
R6	2.2Meg	½	IR-13	BTS-2.2Meg	AF Amp. Grid
R7	470KΩ	½	IR-11	BTS- 470K	AF Amp. Plate
R8	470KΩ	½	IR-11	BTS-470K	Output Grid
R9	150Ω	½	IR-14	BTS-150	Output Cathode
R10	2200Ω	1	IR-25	BTA-2200	Filter
R11	33Ω	½	IR-17		Rectifier Ballast
R12	33Ω	½	IR-17		Surge Limiter
R13	220KΩ	½	IR-20	BTS-220K	Isolation

Note Not Used In All Models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.3KΩ	3.4Ω	150Ω	.5Ω	Part of SPK-6	A03332 ①	A-3025 ①		① Bend Mtg. Tabs Down And Mount On Original Brackett.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.4Ω	SPK-6	ST-113 Model P4-X	4A07	
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

COILS (RF-IF)

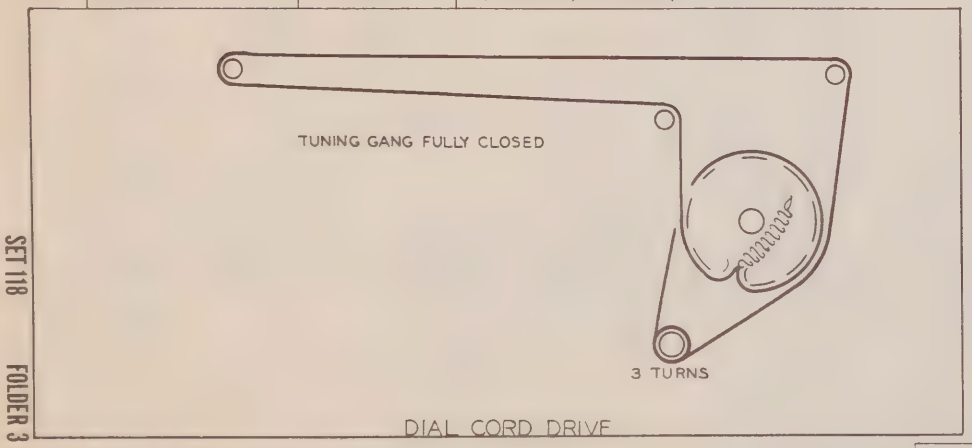
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	AIRCASTLE PART No.	MEISSNER PART No.	
L1	Loop Ant.	.1Ω	2Ω	LL-12		
L2	Osc. Coil	1Ω	7Ω	LO-13	14-1060	
L3	1st IF	22Ω	22Ω	LI-1	16-6658	
L4	2nd IF	14Ω	14Ω	LI-2	1 6-6660	

DIAL LIGHTS

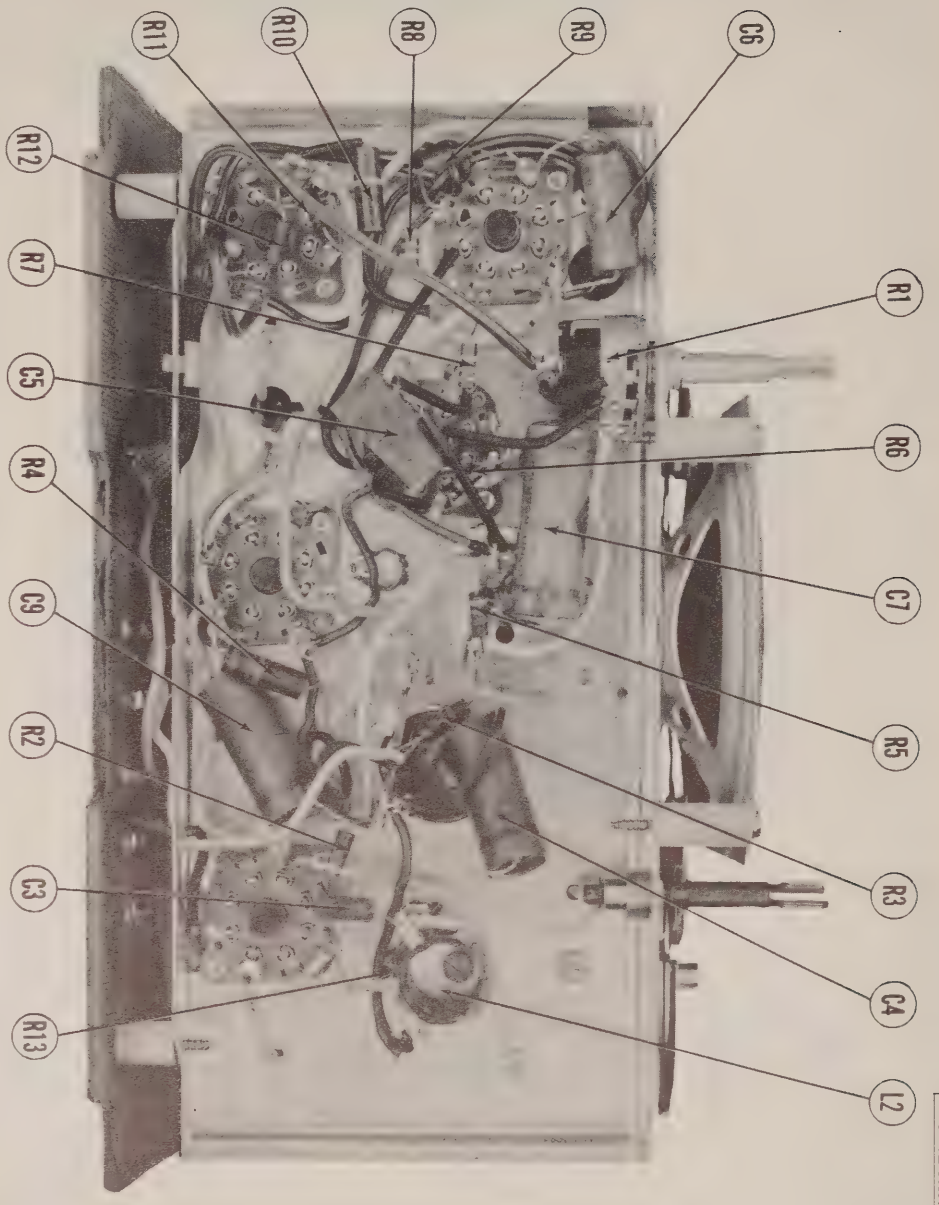
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIRCASTLE PART No.		
M1	Bayonet	6-8	.15	Brown	PB-1		Type Number 41

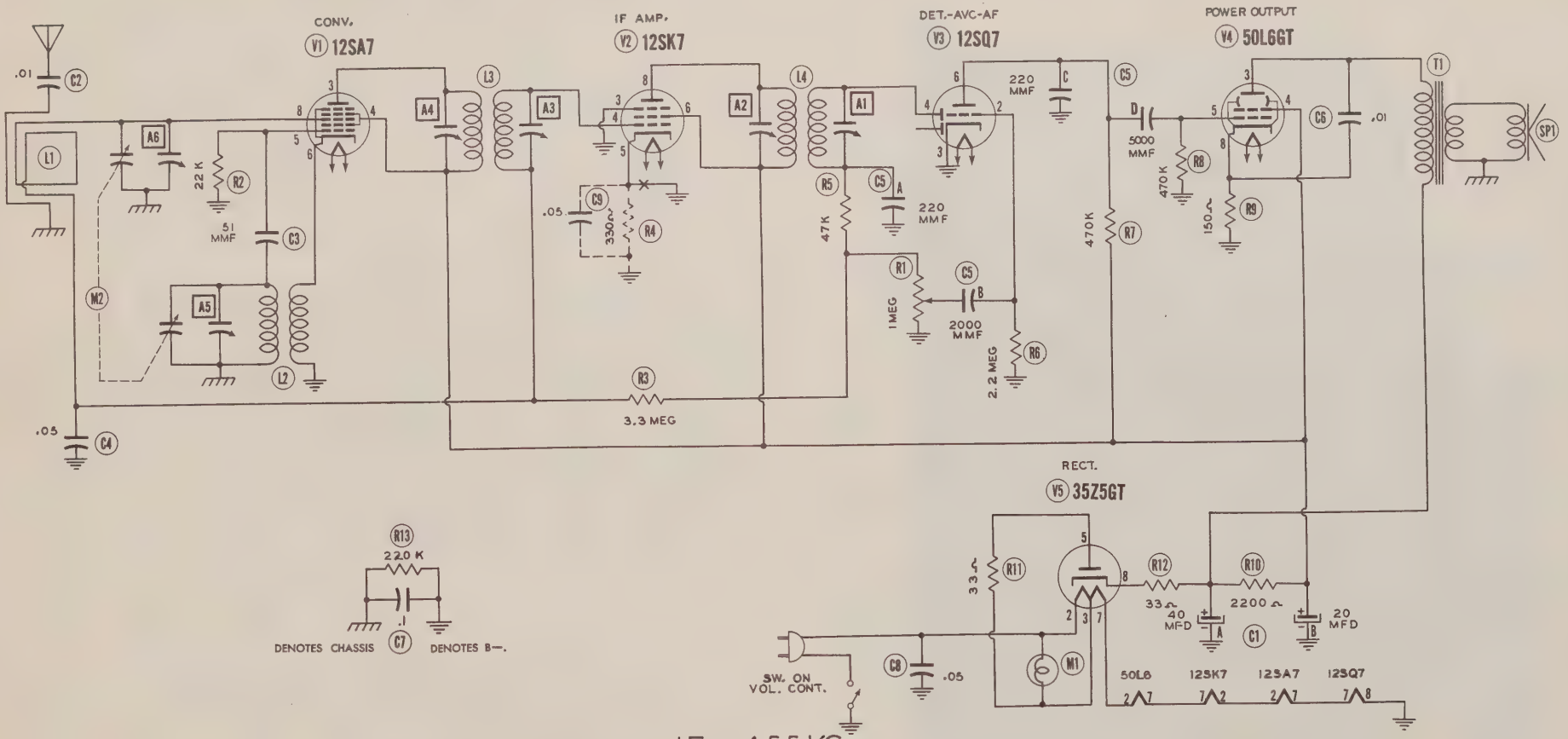
MISCELLANEOUS

ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M2	2Gang Var. Cap	GC-6A	(15-447MMF, 13-192 MMF)



CHASSIS—BOTTOM VIEW





IF= 455KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	0V	25VAC	75VDC	75VDC	§-5.4VDC	0V	13VAC	-.4VDC
V 2	12SK7	0V	25VAC	0V	-.4VDC	2.2VDC	75VDC	37VAC	75VDC
V 3	12SQ7	0V	-.9VDC	0V	-.5VDC	0V	35VDC	13VAC	0V
V 4	50L6GT	0V	90VAC	100VDC	75VDC	.1VDC	0V	37VAC	23VDC
V 5	35Z5GT	0V	117VAC	110VAC	0V	105VAC	107VDC	90VAC	110VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	220KΩ	25Ω	†2.2KΩ	†2.2KΩ	22KΩ	1Ω	13Ω	4.3Meg
V 2	12SK7	220KΩ	25Ω	0Ω	4.3Meg	330Ω	†2.2KΩ	36Ω	†2.2KΩ
V 3	12SQ7	220 KΩ	2.2Meg	0Ω	1Meg	Inf.	†470KΩ	13Ω	0Ω
V 4	50L6GT	Inf.	85Ω	†180Ω	†2.2KΩ	470KΩ	0Ω	36Ω	150Ω
V 5	35Z5GT	220KΩ	120Ω	115Ω	Inf.	150Ω	†33Ω	85Ω	65KΩ

† MEASURED FROM PIN 8 OF V5

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

CRESTWOOD
MODEL CP-201

Figure 1

GENERAL INFORMATION

The Crestwood Tape Recorder, Model CP-201, is designed to magnetically record on a standard 7-inch reel of 1/4" wide tape, two tracks instead of one, which doubles the playing time with no loss in frequency response or quality.

Erasing, in the Model CP-201, is obtained by a 35 KC frequency at approximately 175 volts through the erase head coil. The erase head is so placed on the recorder that the tape passes through it before the recording head. Erasure takes place automatically as recording occurs, so that no special step is necessary.

Power supply is from 105-120 volts, 60 cyclesAC. Do not connect the unit to DC power source.

Manufactured by:

Crestwood Recorder Corporation
218 South Wabash Avenue
Chicago 4, Illinois

This material compiled and published by

HOWARD W. SAMS & CO., INC., INDIANAPOLIS, INDIANA

DATE 12-50 SET 118 FOLDER 4

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OPERATING INSTRUCTIONS

Preparing the Crestwood for Recording -

1. Insert line cord in a convenient wall receptacle of the proper rating.

2. Turn the volume control knob to the right - pilot light will light up.

3. Place a full reel of tape on the right hand spindle (11). Make sure the magnetic coating (dull side) is on the right spindle (11). Make sure the magnetic coating (dull side) is on the outside of the reel.

4. Place an empty reel on the left-hand spindle (22), and feed the end of the tape in the slot located between the two reels and then through one of the radial slots in the empty reel. Hold the end of the tape and rotate the reel, in a clockwise direction, four or five revolutions. The tape should now be firmly fastened to the takeup reel. The dull side of the tape should face outward on the supply reel and on the takeup reel.

5. Turn the "Record-Play" knob to the "Record" position.

6. If a microphone recording is to be made, connect the microphone to the "Mike" jack.

7. If a recording from a radio is desired, it is recommended that the connector cord be connected to the speaker voice coil, by means of the alligator clips, and the other end of the cord plugged into the microphone jack. It is also possible to make a connection to the plate side of the detector tube. This kind of connection may be desirable in some cases, because any circuit deficiencies in the amplifier of the radio will not be included in the recording.

8. Adjust the volume control so the neon light level indicator flashes intermittently. Care should be taken to adjust the input signal to such a level that, with a setting of 4 on the volume control, the neon level indicating light will flash intermittently. If the volume control setting for intermittent flashing of the neon light is 3, or below, the input signal level to the microphone jack is too low. A too high level input signal will cause an overload in the 12AX7 amplifier tube, and, when played back, the recording will be distorted. (Setting of the tone control is immaterial. It is not in the circuit on "Record.")

9. Turn the control knob (1) to the "Forward" position. This engages the drive mechanism and begins the recording.

10. To stop the recording, turn the control knob (1) to the "Stop" position.

The Crestwood is designed for two-channel recordings; therefore, when the full reel has been recorded, the two reels should then be interchanged, without rewinding, and the procedure, as outlined in steps 3 to 10, repeated.

To Rewind -

To rewind a recording, merely turn the control knob (1) to the "Rewind" position.

To Play a Recording -

1. Insert the line cord plug into a convenient wall receptacle of the proper rating.

2. Turn the "Volume" control knob to the right - pilot light will light up.

3. Place the full reel of the tape on the right-hand spindle (11). Make sure the dull-coated side is on the outside of the reel.

4. Place an empty reel on the left-hand spindle (22) and feed the end of the tape in the slot located between the two reels and then through one of the radial slots in the empty reel. Hold the end of the tape and rotate the reel, in a clockwise direction, four or five revolutions. The tape should now be firmly fastened to the takeup reel. The dull side of the tape should face outward on the supply reel and the takeup reel.

5. Turn the "Record-Play" switch to the "Play" position.

6. Turn the control knob (1) to "Forward" position. This engages the drive mechanism and begins the play-back.

7. Adjust the Volume and Tone controls to suit.

ADJUSTMENTS

An open Record Head (10A) or Erase Head (10) must be replaced completely; however, a worn-out, or damaged Record Head or Erase Head lamination can be replaced as follows:

Remove entire head and bracket assembly (15) without disturbing the individual heads. On record head (10A), remove record head laminations by prying out with a screw driver. Press in new laminations with your fingers until laminations are seated in the yoke. The erase head lamination can be replaced in the same way.

Identification of the laminations follows:

Record Head Lamination - Small Gap (.0005") with narrow steel and wide brass strip.

Erase Head Lamination - Wide Gap (.010") with wide steel and narrow brass strip.

Overall width on Erase Head (10) is greater than Record Head. Since the Crestwood is a two-channel machine, it is important to replace laminations with the steel sections uppermost in the Tape Guide.

Motor Power and Erase Switch -

The motor power switch (42) is set with the motor in the "Stop" position so that the contacts are open by the brazing action of the switch blade against the bakelite pin in the motor swing plate.

The Erase "Safety" switch (43) is mounted in the neutral "Stop" position so that the contacts are open and a gap of approximately 1/16" appears between motor mounting assembly (51) and the insulating bushing on the switch. The switch is so adjusted that

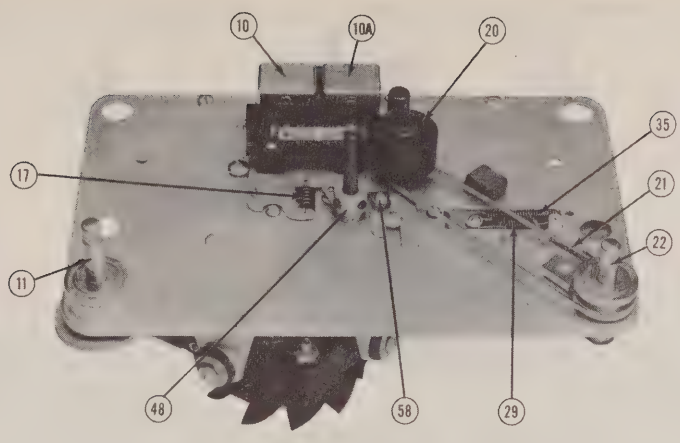


Figure 2

it makes a firm contact when the control knob is set in the "Forward" position. (This switch prevents accidental erasure while rewinding.)

The Forward Stop Lug -

The forward stop lug (57), Figure 3, should be set so the motor mounting assembly (51) comes to a rest position against it as soon as the drive roller (56) makes firm contact with the flywheel (39). Excessive pressure against the flywheel will prevent the motor from starting when the control lever is pressed quickly into the "Forward" position. Insufficient pressure will result in a slippage and "Wow." The best setting is to adjust the forward stop lug (57), Figure 3, 1/16" from the edge of the swing plate (51) at the point when the drive roller begins to touch the flywheel.

There is no rewind stop adjustment; however, the rewind drive pulley is located in a hanger whose position is adjusted by bending the stop lug (46A) against the swing plate bushing in a manner that will allow a clearance between the drive roller (56) and the rewind pulley (47) in the "Stop" position. This will also allow the drive roller to engage the drive pulley in the "Rewind" position. In this position, the rewind drive pulley hanger (46) is away from the stop, pressing the drive roller by means of the torsion spring that needs no adjustment.

Pressure Lever and Arm Adjusting Plate -

Set the pressure lever (16) so that it is vertical when the control knob is in the "Forward" or "Record-Playback" position. Also adjust the arm adjusting plate (58), Figure 2, so it will clear the pressure arm (16) by 1/64" when in this position. With normal adjustments, the tape guide (9) will move very slightly, or not at all, when the control is turned from the "Off" to the "Rewind" position.

Brake Spring -

The brake spring (29) should be adjusted so that the brake (26) clears the takeup pulley (44) and allows it to turn freely in either the "Forward" or "Rewind" position. The pressure in the "Off" or "Stop" position should be sufficient to prevent "coasting" of the reel. If the brake clearance is not equal in the "Forward" and "Rewind" positions, then the adjustment on the motor transfer lever (49) is incorrect.

Transfer Lever -

The transfer lever (49) should be adjusted when the control is in the "Off" or "Stop" position. Move the transfer lever (49) slightly and tighten the set screws of the transfer lever (49) when the drive roller (56) is midway between the rewind drive pulley (47) and the flywheel (39).

Head Pressure -

The head pressure is adjusted by means of two screws in the slotted holes in the head bracket (15). Both the Record Head (10A) and the Erase Head (10) should be adjusted into the tape guide block until the pressure pads on the reverse side show a movement of slightly less than 1/32". This adjustment gives the necessary 30 grams head pressure against the shoe for each head. "Wow" will result if too much pressure is used at this point.

Head Alignment -

The lateral movement of each head is done by moving the heads in the required direction by means of the screws in the slotted holes that hold the heads to the head bracket (15). The position should be such that there is no hanging up of the tape pressure guide when the control lever is turned to the "Stop" position.

The Record Head (11A) should be adjusted so that the air gap in the lamination is at right angles to the direction of the tape travel.

TROUBLES

Irregular Speed "Wow" -

1. Felt pressure pads in tape guide assembly (9) worn.

2. Oil or grease on drive roller (56) or pressure roller (20).

3. Head pressure too great (see adjustment on head pressure). Be careful not to disturb the head alignment.

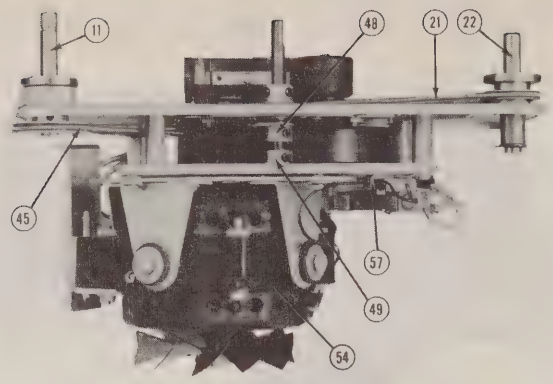


Figure 3

4. Insufficient pressure on pressure roller (20). Tighten spring (17) or replace roller (20).

5. Drive roller (56) or pressure roller (26) eccentric. Allow mechanism to run for 20 minutes. If after this time the rollers are still eccentric, replace with new rollers.

6. Motor shaft binding. Motor shaft should turn freely when the control knob is in the "Off" position. If necessary, realign bearings by tapping motor lightly with wooden mallet.

Motor Runs but Mechanism Will not Operate -

1. Motor Stop is adjusted incorrectly (see adjustment on "Pressure Lever and Arm Adjusting Plate").

2. Drive roller (56) defective. Replace.

Mechanism Runs Forward but Will not Rewind, or Vice Versa -

1. Check rewind belt (45) or take-up belt (21) for being broken or loose. Replace.

2. Motor Stop not adjusted properly (see adjustment on "Pressure Lever and Arm Adjusting Plate").

3. Pressure roller (20) interferes with panel in rewind position. Remove pressure roller (20) and chamfer bottom edge of roller 1/16" x 45°.

Control Knob Turns but Motor Assembly Does not Swing -

1. Motor transfer lever (49) set screws loose. Tighten the set screws with the mechanism in the "Stop" or "Neutral" position.

2. Transfer lever (49) loose at hub. Replace.

No Positive Detent Position for Motor Assembly -

1. Detent lever (48) loose. Tighten set screws.

2. Check detent lever (48) to see if it is loose at the hub. If so, replace.

Slow Speed -

1. Low-operating temperature.

2. Pressure arm spring (17).

3. Head pressure too great (see adjustment on "Head Pressure").

4. Flywheel (39) shaft binding. Check to see that the screws holding front and rear plates are tight and that plates are not warped.

5. Motor shaft binding. Realign bearings by tapping lightly on the motor.

Machine Will Play Back but Does not Record -

1. Defective microphone.

2. Microphone plugged in speaker outlet.

3. Defective amplifier.

High Background Noise (Hiss) -

1. Defective bias oscillator tube or circuit.

2. Defective tape.

3. Defective Record-Playback Head.

4. Record head magnetized. Demagnetize with 60-cycle AC air core coil.

Incomplete Erase -

1. Erase Voltage power too low.

2. Defective 6C4 oscillator.

3. Erase head open. Replace.

4. Poor contact on Record-Play switch.

Poor Recording -

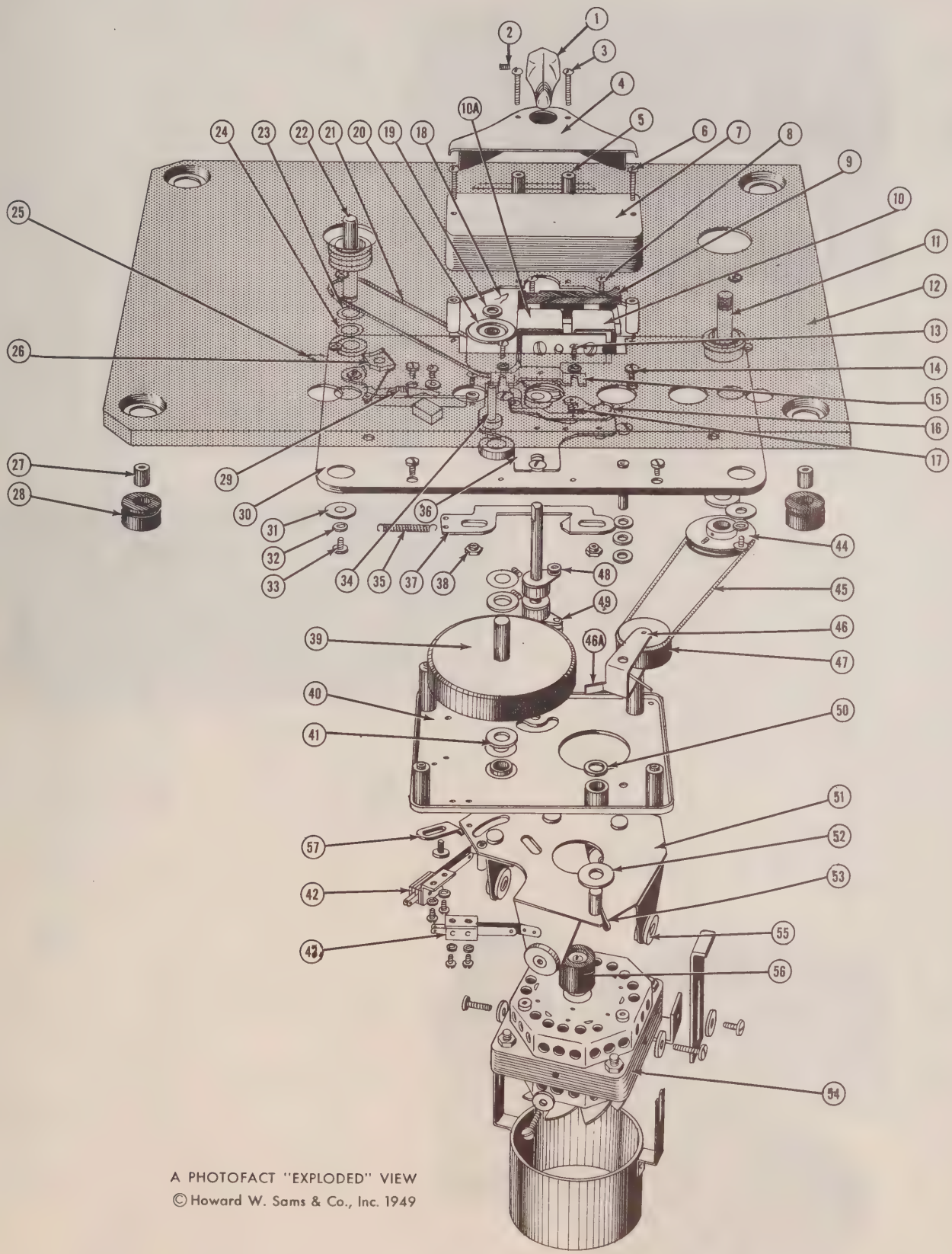
1. Head gap not at right angles to tape (see adjustment on "Head Alignment").

2. Overloading.

3. Defective, or damaged, head.

4. Head lamination damaged or worn.

5. Poor contact of head to tape caused by worn felt pressure pad.



A PHOTOFACT "EXPLODED" VIEW

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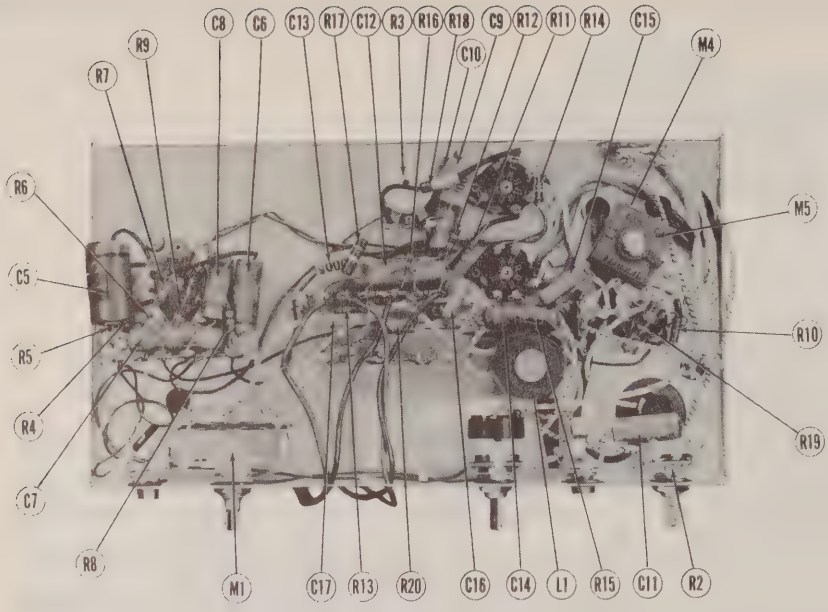


Figure 4

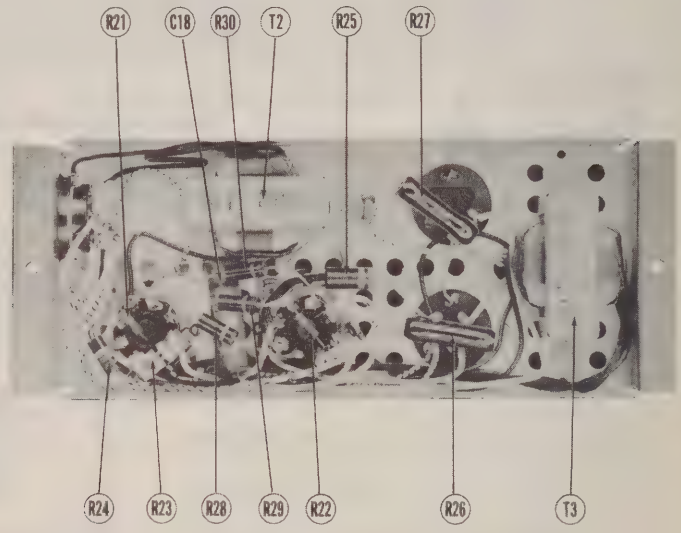


Figure 5

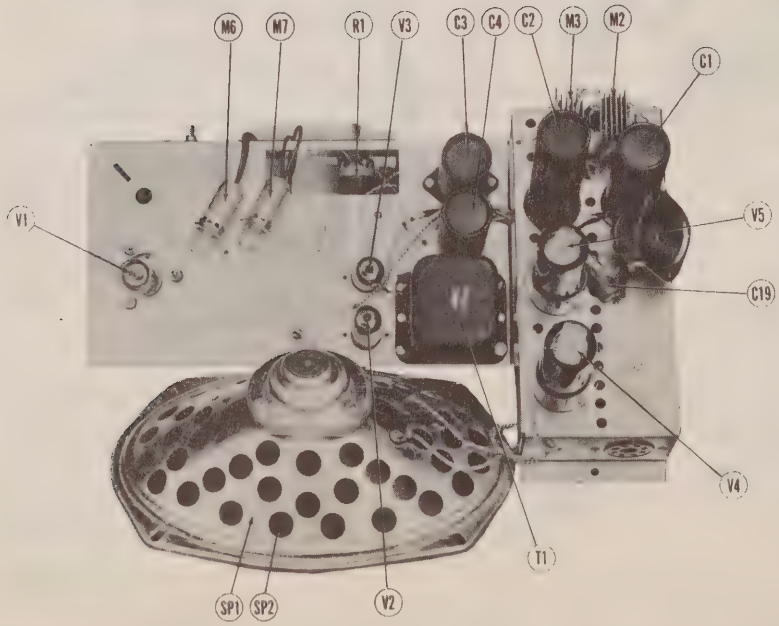
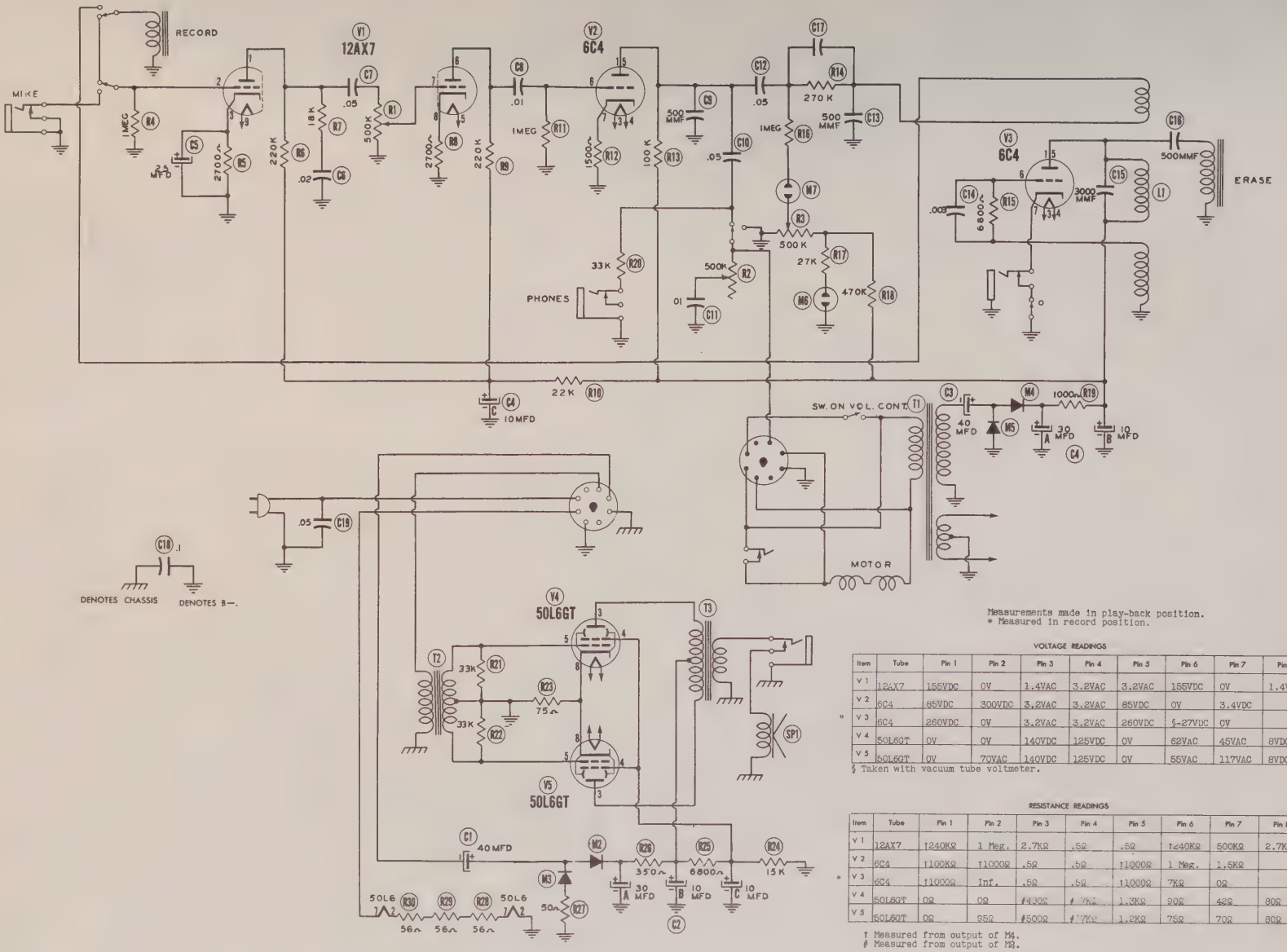


Figure 6



Measurements made in play-back position.
* Measured in record position.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	155VDC	0V	1.4VAC	3.2VAC	3.2VAC	155VDC	0V	1.4VDC	3.2VAC
V 2	6C4	85VDC	300VDC	3.2VAC	3.2VAC	85VDC	0V	3.4VDC		
V 3	6C4	260VDC	0V	3.2VAC	3.2VAC	260VDC	§-27VDC	0V		
V 4	50L6GT	0V	0V	140VDC	125VDC	0V	62VAC	45VAC	8VDC	
V 5	50L6GT	0V	0V	70VAC	140VDC	125VDC	0V	55VAC	117VAC	8VDC

§ Taken with vacuum tube voltmeter.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12AX7	†240KΩ	1 Meg.	2.7KΩ	.5Ω	.5Ω	†240KΩ	500KΩ	2.7KΩ	.5Ω
V 2	6C4	†100KΩ	†1000Ω	.5Ω	.5Ω	†1000Ω	1 Meg.	1.5KΩ		
V 3	6C4	†1000Ω	Inf.	.5Ω	.5Ω	†1000Ω	7KΩ	0Ω		
V 4	50L6GT	0Ω	0Ω	#430Ω	# 7KΩ	1.3KΩ	90Ω	42Ω	80Ω	
V 5	50L6GT	0Ω	95Ω	#500Ω	# 7KΩ	1.2KΩ	75Ω	70Ω	80Ω	

† Measured from output of M4.
# Measured from output of M2.

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MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	P122	Control Knob
2		Set Screw for Control Knob
3		Plate Mounting Screws
4	M101	Front Plate
5	R320	Plate Spacer
6		Plate Mounting Screw
7	M102	Rear Plate
8		Pressure Arm Stop Screw
9	A105	Tape Guide Assembly
10	A108	Record and Erase Head Mounting Assembly
	A107	Erase Head
	P128	Erase Head Lamination
10A	A106	Record Head
	P127	Record Head Lamination
11	A116	Rewind Shaft Assembly
12		Main Base Plate
13		Mounting Screw for Head Bracket
14		Mounting Screw
15	M116	Head Bracket
16	M104	Pressure Arm
17	P114	Pressure Arm Spring
18	S102	Hairpin Clip
19		Flat Washer
20	A183	Pressure Roller
21	P113	Take-up Drive Belt
22	A115	Take-up Shaft Assembly
23		Flat Washer
24		Flat Washer
25	S103	Hairpin Clip
26	A114	Brake Assembly
27		Spacer
28		Rubber Mounting Grommet
29	P116	Brake Spring
30		Sub-Mounting Plate
31		Flat Washer
32		Lock Washer
33		Mounting Screw
34	R306	Roller Stud
35	P115	Detent Spring
36	M103	Roller Plate
37	M107	Detent Slide
38	R419	Shouldered Nut
39	A101	Fly-Wheel Assembly
40		Mounting Plate
41	P110	Felt Washer
42	P119	Stack Switch Motor
43	P120	Stack Switch Erase
44	R437	Rewind Pulley
45	P112	Rewind Drive Belt
46	M111	Rewind Arm
47	R348	Rewind Drive Pulley
	A111	Rewind Pulley Assembly
48	A113	Pressure Lever Assembly
	A109	Detent Lever Assembly
49	A110	Motor Transfer Assembly
50		Flat Washer
51	A102	Motor Swing Plate Assembly
52	P111	Felt Washer
53	S101	Cotter Pin
54	P125	Motor
55	P123	Rubber Grommets
56	A181	Rubber Drive
57	M109	Motor Stop Lug
58	M105	Arm Adjusting Plate

ELECTRICAL PARTS LIST

Item No.	Description
V1	Pre-amp. 12AX7
V2	AF Amplifier, 6C4
V3	Oscillator, 6C4
V4	Power Output, 50L6GT
V5	Power Output, 50L6GT
C1	Voltage Doubler Cap. (Electrolytic), 40 MFD. @ 250 V.
C2A	Filter (Electrolytic), 30 MFD. @ 350 V.
C2B	Filter (Electrolytic), 10 MFD. @ 350 V.
C2C	Filter (Electrolytic), 10 MFD. @ 350 V.
C3	Voltage Doubler Cap. (Electrolytic), 40 MFD. @ 250 V.
C4A	Filter (Electrolytic), 30 MFD. @ 350 V.
C4B	Filter (Electrolytic), 10 MFD. @ 350 V.
C4C	Decoupling (Electrolytic), 10 MFD. @ 350 V.
C5	Pre-amp. Cathode Bypass (Electrolytic), 25 MFD. @ 50 V.
C6	Tone Compensation, .02 MFD. @ 400 V.
C7	Audio Coupling, .05 MFD. @ 400 V.
C8	Audio Coupling, .01 MFD. @ 400 V.
C9	AF Plate Bypass, 500 MMFD. @ 500 V.
C10	Audio Coupling, .05 MFD. @ 400 V.
C11	Tone Compensation, .01 MFD. @ 400 V.
C12	Audio Coupling, .05 MFD. @ 400 V.
C13	Voltage Divider, 500 MFD. @ 500 V.
C14	Bias Oscillator Grid Cap., .003 MFD. @ 600 V.
C15	Fixed Trimmer, 3000 MMFD. @ 500 V.
C16	Bias Oscillator Coupling, 500 MMFD. @ 500 V.
C17	Voltage Divider, 250 MMFD. @ 500 V.
C18	Line Isolation, .1 MFD. @ 200 V.
C19	Line Filter, .05 MFD. @ 400 V.
R1	Volume Control and Switch, 500K Ohm
R2	Tone Control, 500K Ohm
R3	Indicator Lamp Flash Control, 500K Ohm
R4	Pre-Amp. Grid, 1 Meg., 1/2 Watt
R5	Pre-Amp. Cathode, 2700 Ohm, 1/2 Watt
R6	Pre-Amp. Plate, 220K Ohm, 1/2 Watt
R7	Tone Compensation, 18K Ohm, 1/2 Watt
R8	Pre-Amp. Cathode, 2700 Ohm, 1/2 Watt
R9	Pre-Amp. Plate, 220K Ohm, 1/2 Watt
R10	Filter, 22K Ohm, 1/2 Watt
R11	AF Grid, 1 Meg., 1/2 Watt
R12	AF Cathode, 1500 Ohm, 1/2 Watt
R13	AF Plate, 100K Ohm, 1/2 Watt
R14	Voltage Divider, 270K Ohm, 1/2 Watt
R15	Oscillator Grid, 6800 Ohm, 1/2 Watt
R16	Series Neon Lamp, 1 Meg., 1/2 Watt
R17	Series Neon Lamp, 27K Ohm, 1 Watt
R18	Voltage Divider, 470K Ohm, 1/2 Watt
R19	Filter, 1000 Ohm, 1 Watt
R20	Series Phono Jack, 33K Ohm, 1/2 Watt
R21	Output Grid, 33K Ohm, 1/2 Watt
R22	Output Grid, 33K Ohm, 1/2 Watt
R23	Output Cathode, 75 Ohm, 1 Watt
R24	Bleeder, 15K Ohm, 1 Watt
R25	Filter, 6800 Ohm, 2 Watt
R26	Filter (Wire Wound), 350 Ohm, 5 Watt
R27	Surge Limiter (Wire Wound), 50 Ohm, 5 Watt
R28	Filament String, 56 Ohm, 1 Watt
R29	Filament String, 56 Ohm, 1 Watt
R30	Filament String, 56 Ohm, 1 Watt
T1	Power Transformer
T2	Driver Transformer
T3	Output Transformer
SP1	PM Speaker
SP2	Cone, 3.2 Ohm Voice Coil
L1	Bias Oscillator Coil
M1	Record-Playback Switch
M2	Selenium Rectifier
M3	Selenium Rectifier
M4	Selenium Rectifier
M5	Selenium Rectifier
M6	Neon Indicator
M7	Neon Indicator

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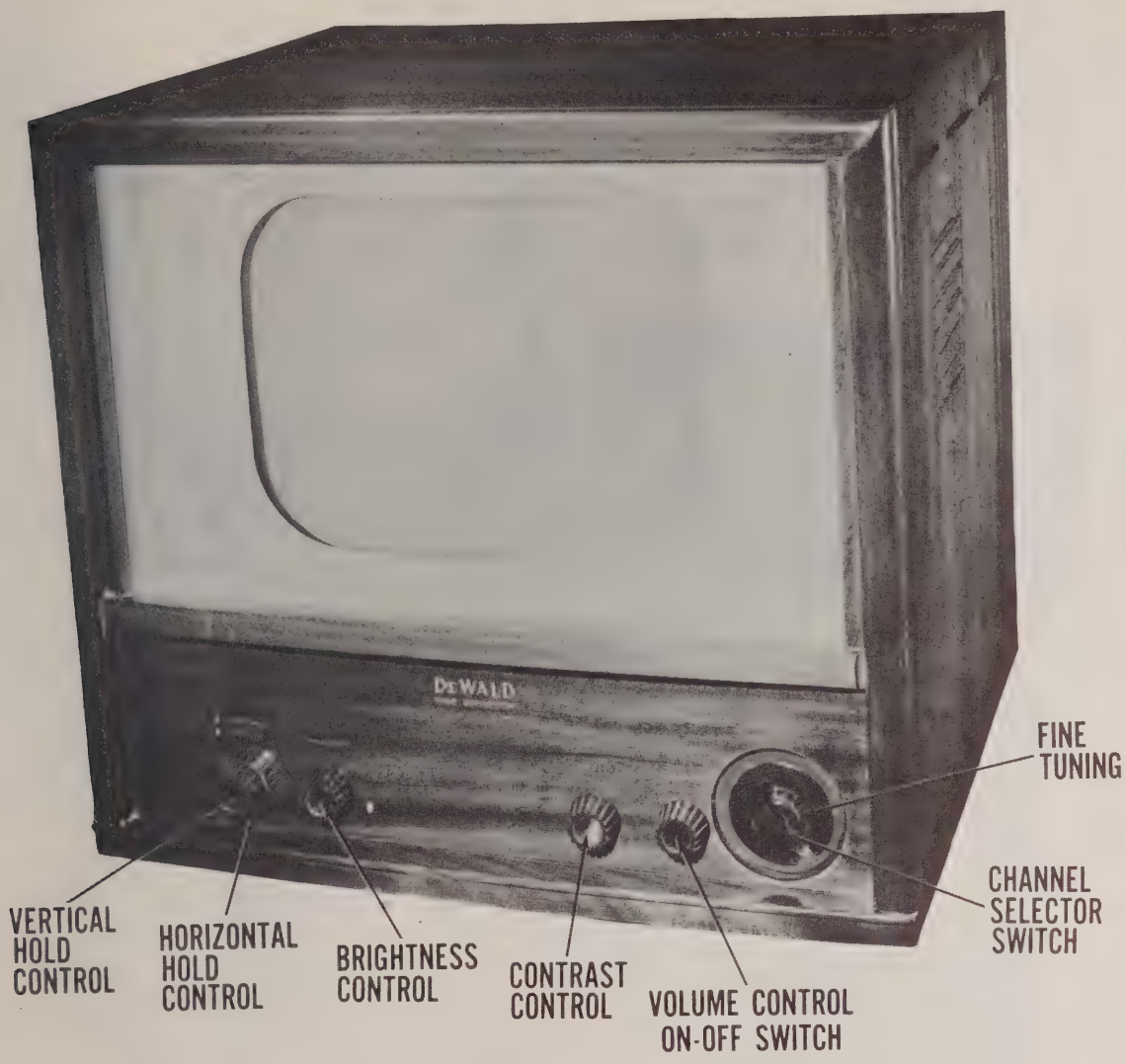

DEWALD MODELS DT-162, DT-163, DT-190, ET-140, ET-141

DEWALD MODEL ET-140

TRADE NAME	Dewald, Models DT-162, DT-163, DT-190, ET-140, ET-141
MANUFACTURER	Dewald Radio Mfg., Co., 35-15 37th Ave., Long Island City, New York
TYPE SET	Television Receiver
TUBES	Twenty Two
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.9 Amp. at 117 Volts AC
TUNING RANGE	Channels 2 thru 13

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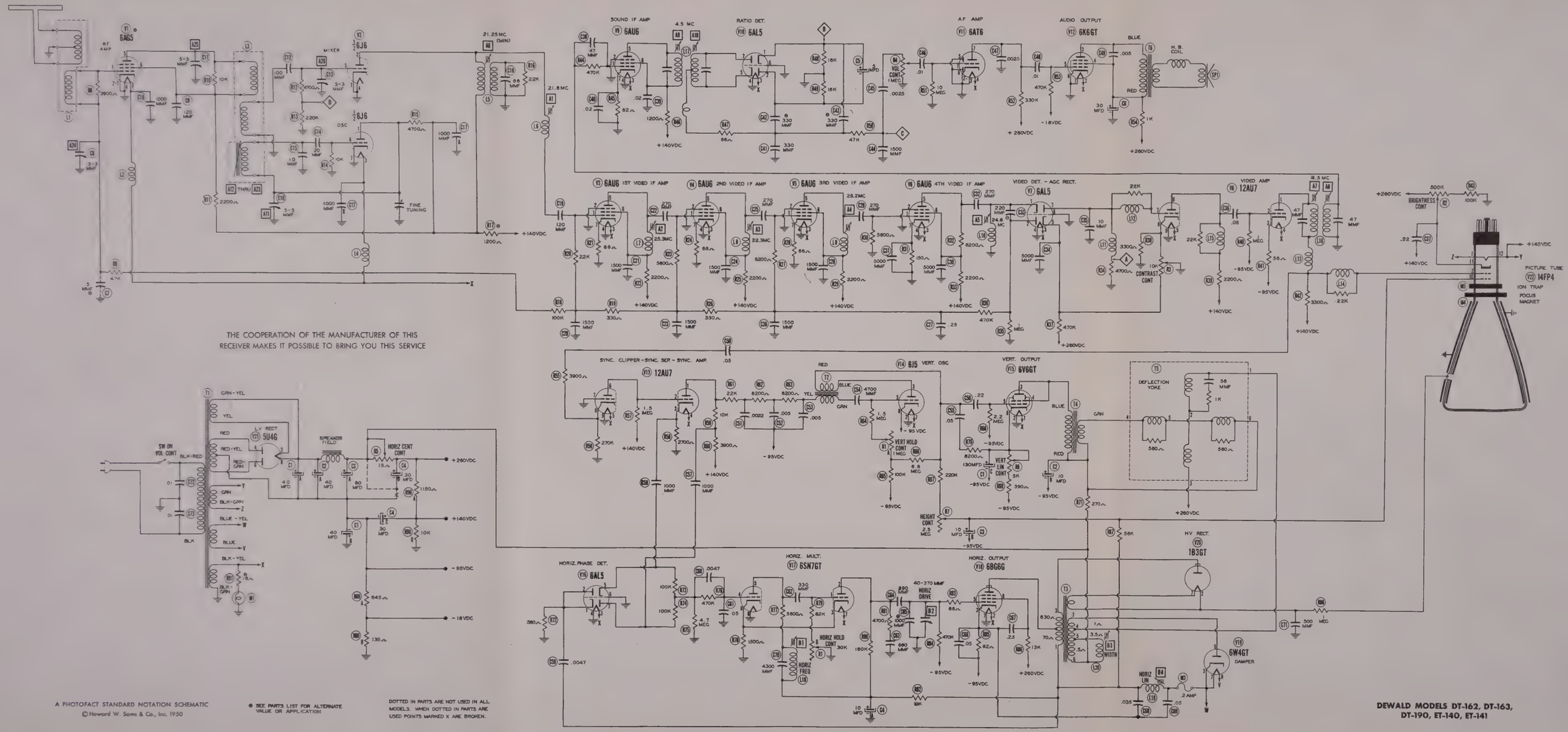

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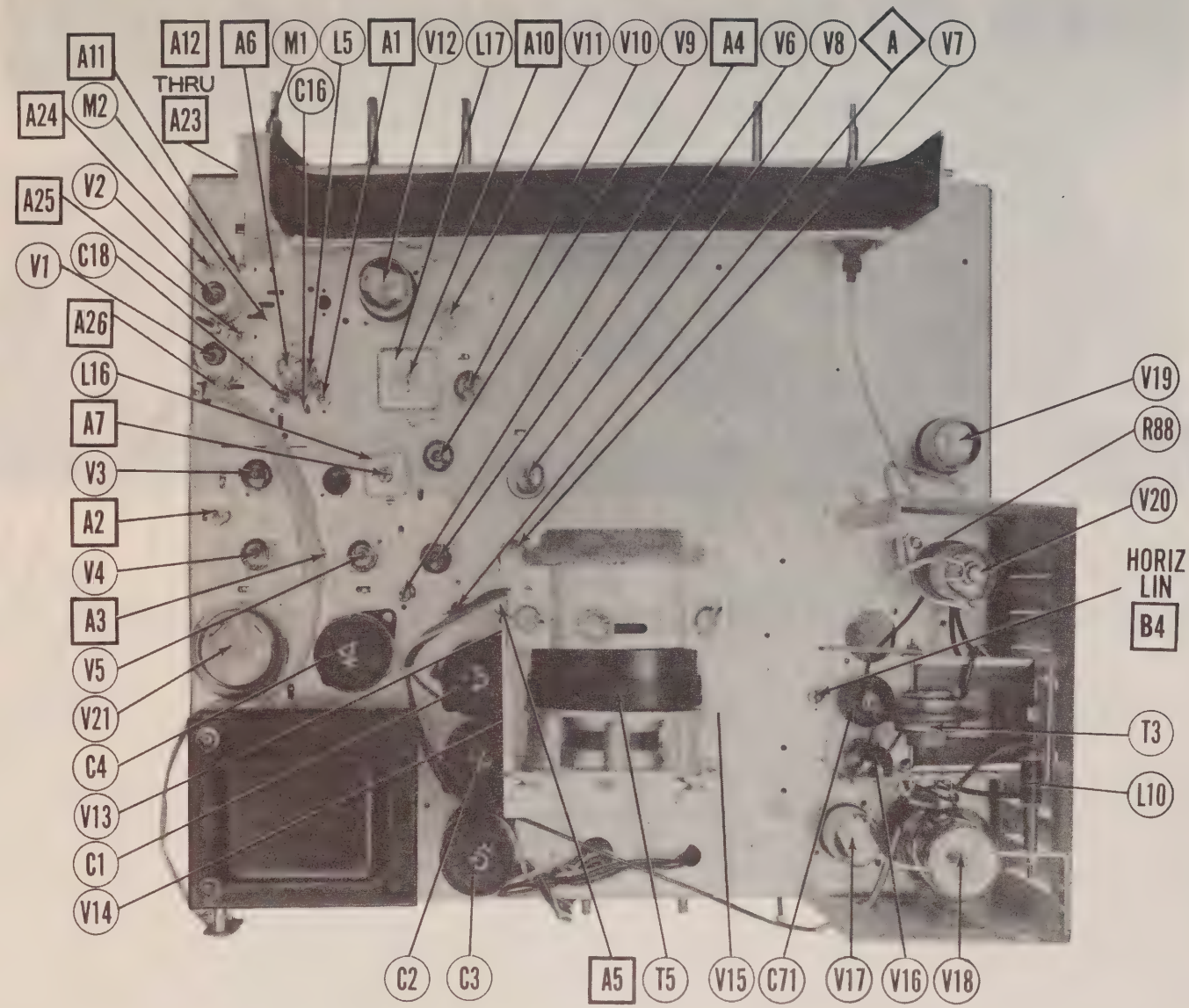

CHASSIS TOP VIEW

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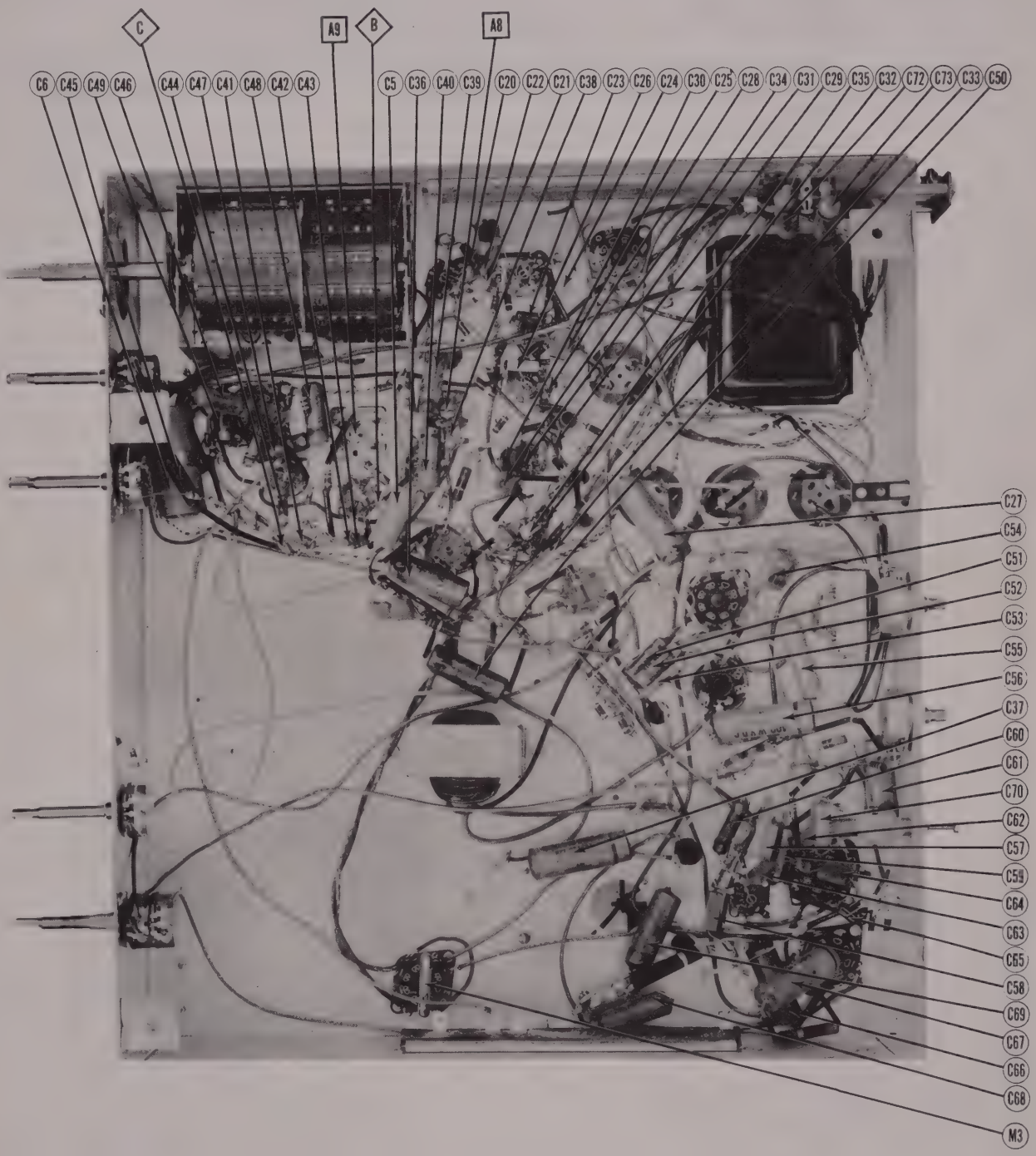
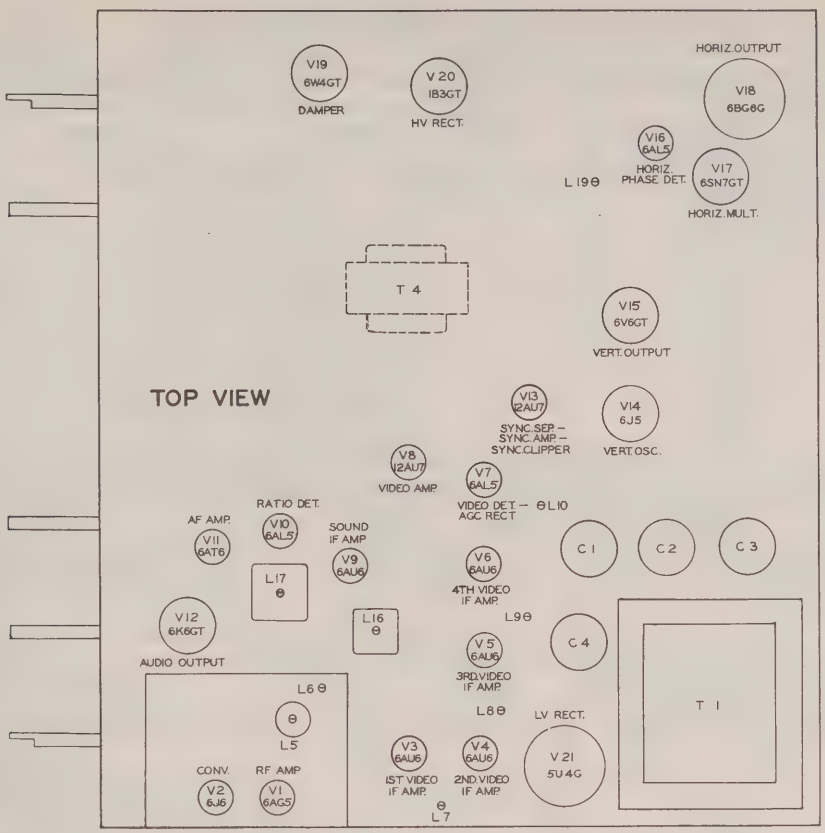
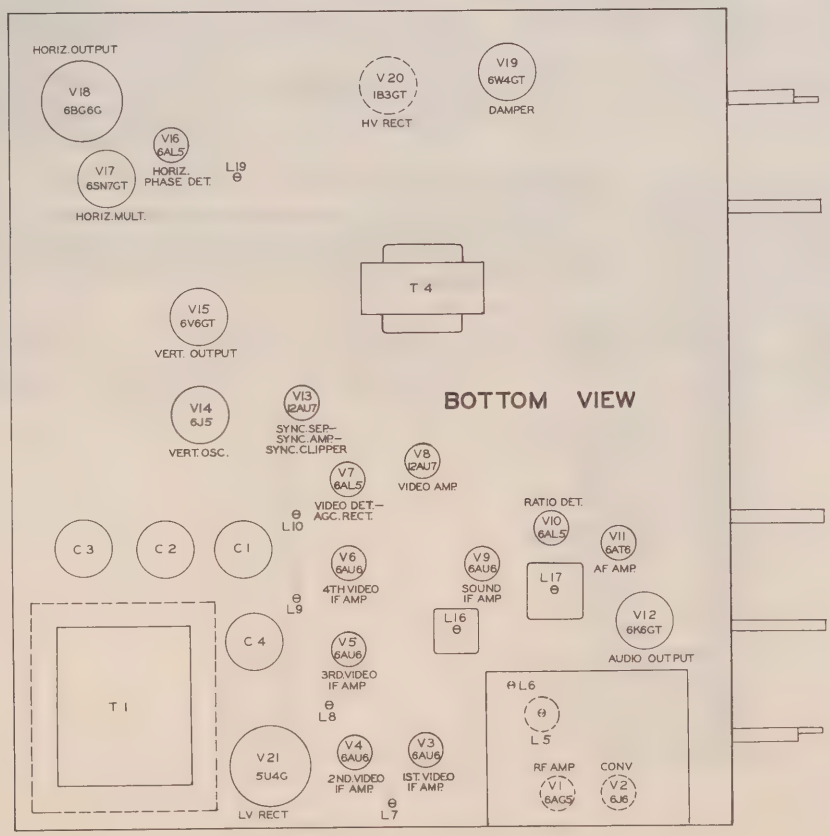


CHASSIS BOTTOM VIEW–CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V17) from its socket.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) from its socket and replace it with a 6J6 which has pin 1 removed, This will eliminate the possibility of erroneous indications from the local oscillator.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	21.8MC (Unmod.)	Any	DC Probe to Point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	Direct	"	25.3MC	"	"	A2	"
3.	Direct	"	22.3MC	"	"	A3	"
4.	Direct	"	25.2MC	"	"	A4	"
5.	Direct	"	24.8MC	"	"	A5	"
6.	Direct	"	21.25MC (max. output)	"	"	A6	Adjust for MINIMUM output.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	25MC (10MC SWP)	21.25MC 22.25MC 25.75MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to figure 1. If necessary retouch A1 thru A5 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01MFD	High side to pin 2 (Grid) of 12AU7 (V8). Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe to Point (B). Common to chassis.	A7, A8, A9	Adjust for maximum deflection.
9.	.01MFD	"	"	"	DC Probe to Point (C). Common to chassis.	A10	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	.01MFD	High side to pin 2 (Grid) of 12AU7 (V8). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (B). Low side to chassis.	A7, A8, A9	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per figure 2.
9.	.01MFD	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A10	Reconnect capacitor C5. Adjust A10 so 4.5MC occurs at center of crossover lines as per figure 3. Slightly retouch A10 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.

Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels, it may be possible to correct them in one step using A-11. It should be noted that this is an all channel oscillator circuit adjustment and should not be adjusted for any individual channel. If adjustment of A-11 will not bring all channels within the range of the fine tuning control, it will be necessary to adjust the individual channel oscillator adjustment screw for each channel that is off frequency. The individual channel oscillator adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct oscillator adjustment screw is reached through this hole as the channel switch is turned to each channel.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (A). Low side to chassis.	A12	Adjust to place sound marker in "notch" as shown in figure 4. The video marker should be at 50%.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A13	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A14	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A15	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A16	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A17	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A18	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A19	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A20	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A21	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A22	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A23	

ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. to Point ◇D◇. Low side to chassis.	A24, A25, A26	Adjust for response curve similar to figure 5 with markers at 90%.
12.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check all channels for response curve similar to figure 5. If markers fall below 70% on any channel, make slight adjustment of A24, A25 and A26 with selector switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

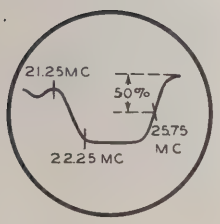


FIG. 1

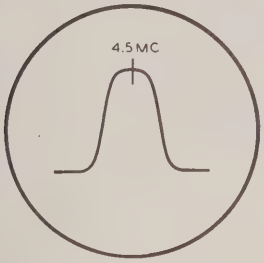


FIG. 2

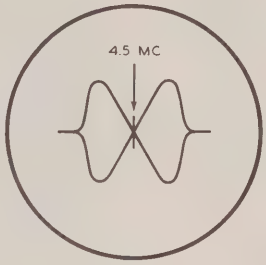


FIG. 3

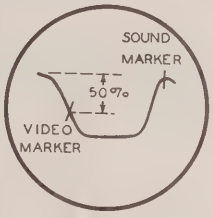


FIG. 4

FIG. 5

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range.

Adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) clockwise as far as possible without crowding the right half of the picture .

Adjust the width slug (B3) until the picture is of proper size horizontally.

Adjust the horizontal linearity slug (B4) until the picture is symmetrical from left to right.

Slight readjustment of (B2) may be necessary for optimum results.

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.7VDC	0V	6.3VAC	0V	100VDC	100VDC	0V		
V 2	6J6	85VDC	115VDC	6.3VAC	0V	-1.9VDC	§-3.9VDC	0V		
V 3	6AU6	-.6VDC	0V	6.3VAC	0V	120VDC	120VDC	.5VDC		
V 4	6AU6	-.3VDC	0V	6.3VAC	0V	120VDC	120VDC	.4VDC		
V 5	6AU6	-.3VDC	0V	6.3VAC	0V	120VDC	120VDC	.4VDC		
V 6	6AU6	0V	0V	6.3VAC	0V	70VDC	120VDC	1.4VDC		
V 7	6AL5	0V	-.4VDC	6.3VAC	0V	0V	0V	-.3VDC		
V 8	12AU7	75VDC	-90VDC	-90VDC	6.3VAC	6.3VAC	135VDC	-.3VDC	6VDC	0V
V 9	6AU6	0V	0V	6.3VAC	0V	125VDC	125VDC	1.1VDC		
V 10	6AL5	.4VDC	-.4VDC	6.3VAC	0V	-.2VDC	0V	.2VDC		
V 11	6AT6	-.7VDC	0V0	0V	6.3VAC	0V	0V	65VDC		
V 12	6K6GT	6.3VAC	6.3VAC	225VDC	240VDC	-6.5VDC	-18VDC	0V	0V	
V 13	12AU7	70VDC	15VDC	-14VDC	6.3VAC	6.3VAC	15VDC	0V	1.7VDC	0V
V 14	6J6	0V	0V	280VDC 40VDC	-100VDC -130VDC	-115VDC -200VDC	-12VDC -16VDC	6.3VAC	-95VDC	
V 15	6V6GT	0V	0V	240VDC	240VDC	-70VDC	0V	6.3VAC	-45VDC -75VDC	
V 16	6AL5	0V	0V	6.3VAC	0V	-4VDC	0V	4VDC		
V 17	6SN7GT	-7VDC	115VDC	13VDC	-.2VDC	300VDC	13VDC	6.3VAC	0V	
V 18	6BG6G	0V	6.3VAC	-85VDC	0V	-95VDC	-2.5VDC	0V	155VDC	TOP CAP *
V 19	6W4GT	0V	0V	400VDC	400VDC	260VDC	0V	400VDC ¶	400VDC ¶	
V 20	1B3GT	* DO NOT MEASURE								
V 21	5U4G	0V	275VDC	0V	255VAC	0V	255VAC	0V	275VDC	
V 22	14FP4	¶	80VDC	PIN 10 390VDC	PIN 11 260VDC	PIN 12 ¶				

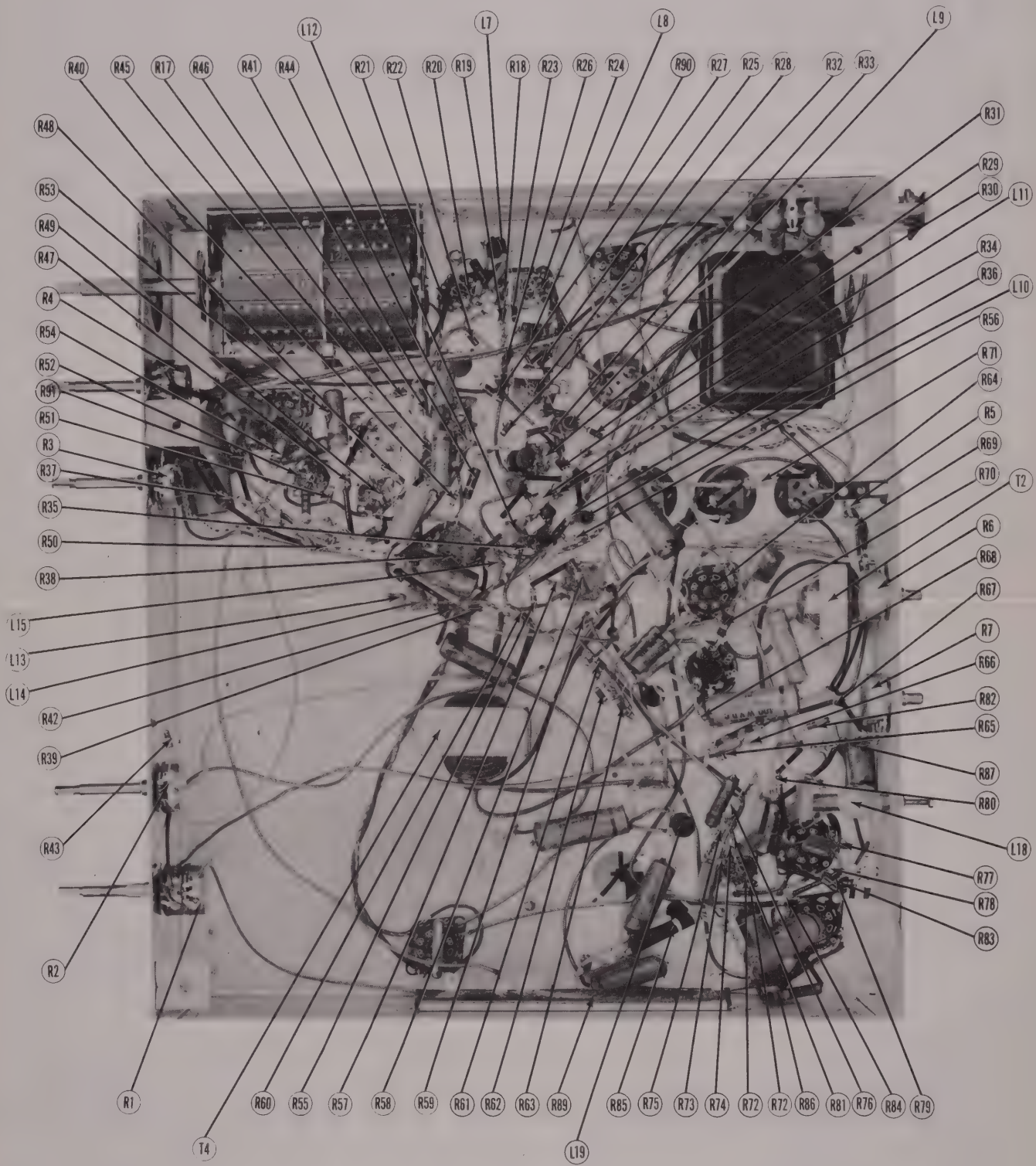
§ TAKEN WITH VACUUM TUBE VOLTMETER
¶ 6.3VAC MEASURED ACROSS FILAMENTS
* DO NOT MEASURE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	1.6 Meg.	0Ω	.1Ω	0Ω	†4.6KΩ	†4.6KΩ	0Ω		
V 2	6J6	†7KΩ	†2.4 KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AU6	1.5 Meg.	0Ω	.1Ω	0Ω	†3.4KΩ	†3.4KΩ	68Ω		
V 4	6AU6	1.5 Meg.	0Ω	.1Ω	0Ω	†3.4KΩ	†3.4KΩ	68Ω		
V 5	6AU6	1.5 Meg.	0Ω	.1Ω	0Ω	†3.4KΩ	†3.4KΩ	68Ω		
V 6	6AU6	5.6KΩ	0Ω	.1Ω	0Ω	†12KΩ	†3.4KΩ	150Ω		
V 7	6AL5	.4Ω	1 Meg.	.1Ω	0Ω	0Ω	0Ω	4.7KΩ		
V 8	12AU7	†4.5KΩ	1 Meg.	830Ω	.1Ω	.1Ω	†3.4KΩ	4.7KΩ	2.7KΩ	0Ω
V 9	6AU6	470KΩ	0Ω	.1Ω	0Ω	†2.4KΩ	†2.4KΩ	82Ω		
V 10	6AL5	18KΩ	18KΩ	.1Ω	0Ω	Inf.	0Ω	Inf.		
V 11	6AT6	10 Meg.	0Ω	0Ω	.1Ω	0Ω	0Ω	†330KΩ		
V 12	6K6GT	.1Ω	.1Ω	†1.6KΩ	†1.1KΩ	470KΩ	135Ω	0Ω	0Ω	
V 13	12AU7	†15KΩ	†1.5Meg.	2.5KΩ	.1Ω	.1Ω	†1.5Meg.	0Ω	270KΩ	0Ω
V 14	6J5	0Ω	0Ω	#290KΩ #2 Meg.	1 Meg.	2.6 Meg.	9.5KΩ 13KΩ	.1Ω	775Ω	
V 15	6V6GT	Inf.	0Ω	†1.1KΩ	†1.1KΩ	2.2 Meg.	Inf.	.1Ω	5.3KΩ 1.3KΩ	
V 16	6AL5	560Ω	560Ω	.1Ω	0Ω	4.8 Meg.	0Ω	4.8 Meg.		
V 17	6SN7GT	110KΩ	#190KΩ	1.5KΩ	5.2 Meg.	#16KΩ	1.5KΩ	.1Ω	0Ω	
V 18	6BG6G	Inf.	.1Ω	860Ω	Inf.	470KΩ	30KΩ	0Ω	†13KΩ	TOP CAP #100Ω
V 19	6W4GT	Inf.	Inf.	200KΩ	#4.5Ω	†70Ω	Inf.	#0Ω	#.2Ω	
V 20	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #730Ω
V 21	5U4G	Inf.	12KΩ	Inf.	800Ω	Inf.	800Ω	Inf.	12KΩ	
V 22	14FP4	10KΩ	†4.5KΩ	PIN 10 #56KΩ	PIN 11 12KΩ	PIN 12 10KΩ				

† MEASURED FROM PIN 8 OF V21
# MEASURED FROM PIN 3 OF V19

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amp.		6AG5	7BD	
B	RF Amp.		6BC5	7BD	
V2	Converter		6J6	7BF	
V3	1st Video IF		6AU6	7BK	
V4	2nd Video IF		6AU6	7BK	
V5	3rd Video IF		6AU6	7BK	
V6	4th Video IF		6AU6	7BK	
V7	Video Det.-AGC Rectifier		6AL5	6BT	
V8	Video Amp.		12AU7	9A	
V9	Sound IF Amp		6AU6	7BK	
V10	Ratio Det.		6AL5	6BT	
V11	AF Amp		6AT6	7BT	
V12	Audio Output		6K6GT	7B	
V13	Sync. Clipper-Sync. Sep.-Sync. Amp.		12AU7	9A	
V14	Vert. Osc.		6J5	6Q	
V15	Vert. Output		6V6GT	7AC	
V16	Hor. Phase Det.		6AL5	6BT	
V17	Hor. Mult.		6SN7GT	8BD	
V18	Hor. Output		6BG6G	5BT	
V19	Damper		6W4GT	4CG	
V20	HV Rect.		1B3GT	3C	
V21	LV Rect.		5U4G	5T	
V22	Picture Tube		14FP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	40	450		AFH6J8D26B		UPT300		TVL-3706	▲ Filter
B	40	150							■ Filter
C	130	50							▲ Vert. Output Cathode
C2A	40	450		AFH8827		UP41145		TVL-2735	▲ Filter
B	10	450							▲ Vert. Output Cathode
C3A	80	450		AFH162J		UPT8145		TVL-2776	▲ Filter
B	10	450							▲ Decoupling
C4A	10	450		AFH266J		UPT301		TVL-3785	▲ Decoupling
B	30	450							■ Filter
C	30	450							▲ Filter
C5	5	50		PR8150/4		BR550		TVA-1303	Stabilizing Cap
C6	30	450		PR8450/30		BR3045		TVA-1711	Output Decoupling
C7	5			SI5	TCZ-4.7		NPOK-5		Fixed Trimmer †
C8	.5-3				829-3				Variable Trimmer
C9	120			SI20	D6-121		GP1K-120	19C29	RF Amp Dec.
C10	1000			SI1000	D6-102		GP2L-001	19C1	RF Amp Filter
C11	.5-3				829-3				Variable Trimmer
C12	100			SI100N750	TCN-100		N750L-100	29C16	RF Coupling
C13	.5-3				829-3				Variable Trimmer
C14	20			SI20NP0	TCZ-20		NPOK-20		Osc. Grid Cap
C15	10			SI10N750	TCZ-10		N750K-10	19C4	Fixed Trimmer
C16	.5-3				829-3				Variable Trimmer
C17A	1000			BPD-2 x 001	DD-2-102		882-2 x 0015	29C7	RF Bypass
B	1000								Conv. Filter Bypass
C18	68	500			TCZ-68		NPOM-68	36C9	Fixed Trimmer
C19	120	500		SI120	D6-121	5W5T15	GP2K-120	19C29	IF Coupling
C20	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C21	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st V. IF Dec.
C22	270	500		1468-00025	D6-271	5W5T25	GP2K-270	19C31	IF Coupling
C23	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C24	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	2nd V. IF Dec.
C25	270	500		1468-00025	D6-271	5W5T25	GP2K-270	19C31	IF Coupling
C26	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C27	.25	200		P488-25		GT2P25		2TM-P25	AGC Filter
C28	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	3rd V. IF Dec.
C29	270	500		1468-00025	D6-271	5W5T25	GP2K-270	19C31	IF Coupling
C30	5000			BPD-005	DD-502	1D5D5	811-005	29C1	4th V. IF Dec.
C31	5000			BPD-005	DD-502	1D5D5	811-005	29C1	4th V. IF Cathode
C32	270	500		1468-00025	D6-271	5W5T25	GP2K-270	19C31	IF Coupling
C33	220	500		1468-00025	D6-221	5W5T25	GP2K-220	19C13	IF Coupling †
C34	5000			BPD-005	DD-502	1D5D5	811-005	29C1	DAGC Decoupling
C35	10			SI10	D6-100	5W5Q1	GP1K-10	19C19	V. Diode Filter
C36	.05	600		P668-05	DF-503	PTE685		6TM-S5	Video Coupling
C37	.22	400		P488-22		GT4P25		4TM-P22	Picture Tube Cath.
C38	47			SI47	D6-470	5W5Q5	GP1K-47	19C25	S. IF Coupling
C39	.02	600		P668-02	DF-203	PTE682		6TM-S2	S. IF Decoupling
C40	.02	400		P488-02	DF-203	PTE482		4TM-S2	S. IF Cathode
C41	330			SI330	D6-331	5W5T3	GP2K-330	19C14	Diode Load Cap.
C42	330			SI330	D6-331	5W5T3	GP2K-330	19C14	Diode Load Cap. *
C43	330			SI330	D6-331	5W5T3	GP2K-330	19C14	Diode Load Cap. *
C44	1500			SI1500	D6-152	1W5D15	GP2L-0015	29C8	De-emphasis
C45	.0025	600		P668-0022	D6-252	PTE6D2	GP2M-0025	6TM-D22	Audio Coupling
C46	.01	600		P668-01	D6-103	PTE681	811-01	6TM-S1	Audio Coupling
C47	.0025	600		P668-0022	D6-252	PTE6D2	GP2M-0025	6TM-D22	De-emphasis
C48	.01	600		P668-01	D6-103	PTE681	811-01	6TM-S1	Audio Coupling
C49	.005	600		P668-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate Byp.
C50	.05	600		P668-05	DF-503	PTE685		6TM-S5	Sync. Coupling
C51	.0022	600		P668-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Integrator Net.
C52	.005	600		P668-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net.
C53	.005	600		P668-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net.
C54	4700	500		1467-005	D6-472	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid
C55	.05	400		P488-05		PTE485		4TM-S5	Vert. Discharge
C56	.22	400		P488-22		GT4P25		4TM-P22	Vert. Sweep Coupling
C57	1000	500		1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C58	1000	500		1467-001	D6-102	1W5D1	GP2L-001	1FM-21	Hor. Sync. Coupling
C59	.0047	600		P668-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	Hor. Feedback
C60	.0047	600		P668-0047	D6-472	PTE6D5	GP2M-0047	6TM-D47	AFC Filter
C61	.05	600		P668-05	DF-503	PTE685		6TM-S5	AFC Filter

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: AEROVOX PART No.	REPLACEMENT DATA: CENTRALAB PART No.	REPLACEMENT DATA: CORNELL-DUBILIER PART No.	REPLACEMENT DATA: ERIE PART No.	REPLACEMENT DATA: SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C62	330	500		1468-00035	D6-331	5W5T3	GP2K-330	1FM-335	Hor. MV Feedback
C63	680	500		SI680	D6-681	1W5T7	GP2K-680	1FM-37	Hor. Discharge
C64	390	500		1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Hor. Sweep Coupling
C65	1000	500		1468-001	D6-102	1W5D1	GP2L-001	1FM-21	Voltage Divider †
C66	.05	600		P668-05	DF-503	PTE685		6TM-S5	Hor. Output Screen
C67	.25	200		P488-25		GT2P25		2TM-P25	Hor. Output Cath.
C68	.035	600		P668-033				6TM-S33	Damper Filter
C69	.05	600		P668-05		PTE685		6TM-S5	Damper Filter
C70	4300	500							Fixed Trimmer
C71	500	20000		HV20C	TV3-502				H.V. Filter
C72	.01	600		P668-01	D6-103	PTE681	811-01	6TM-S1	Line Filter
C73	.01	600		P668-01	D6-103	PTE681	811-01	6TM-S1	Line Filter

* When Either Item C42 Or C43 Are Replaced, Replace Both With Capacitors Of Equal Value.
† Not Used In All Models.
‡ Some Models Use 470 MMF In This Application.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: IRC PART No.	REPLACEMENT DATA: CLAROSTAT PART No.	REPLACEMENT DATA:	INSTALLATION NOTES
R1A	1Meg	½	3034A-2	Concentrikit	RTV-2	SBB-583	Vertical hold control - front
B	30KΩ	½		B11-137 *			Horizontal hold control - rear
C	Shaft End			B11-121 *			Attach to R1A per instr. in concentrikit
				E-187 *			
R2A	500KΩ	½	3031A-7	Q11-133	AM-58-S	AN-59	Brightness control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R2A per instructions
R3A	10KΩ	½	3031A-9	Q11-116	AM-27-S	AN-14	Contrast control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R3A per instructions
R4A	1Meg	½	3031A-10	Q13-137	ASK-63-Z	BSK-70-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R4A per instructions
C	Switch		Not Req.	76-1	SW-A	Not Req.	Attach to R4A per instructions
R5	15Ω	1					Horizontal centering - wire wound
R6A	5000Ω	½	3031A-4	Q11-114	AM-19-S	AN-10	Vertical linearity control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R6A per instructions
R7A	2.5Meg	½	3031A-5	Q11-239	AM-84-S	AN-83	Height control
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Attach to R7A per instructions

* Additional Parts To Be Used With Concentrikit.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ± 10% UNLESS OTHERWISE STATED
R8	3900Ω	½		BTS-3900	Antenna Coil Shunt
R9	47KΩ	½		BTS-47K	AGC Network
R10	10KΩ	½		BTS-10K	RF Coil Shunt
R11	2200Ω 20%	½		BTS-2200	RF Amp Plate
R12	4700Ω	½		BTS-4700	Mixer Grid
R13	220KΩ 20%	½		BTS-220K	Mixer Grid
R14	10KΩ	½		BTS-10K	Osc. Grid
R15	4700Ω	½		BTS-4700	Osc. Plate
R16	22KΩ	½		BTS-22K	Sound Trap Network
R17	1500Ω	½		BTS-1200	Voltage Divider - See Note 1
R18	100KΩ	½		BTS-100K	AVC Network
R19	330Ω	½		BTS-330	AVC Network
R20	22KΩ	½			1st Video IF Amp Grid
R21	68Ω	½			1st Video IF Amp Cathode
R22	2200Ω	½		BTS-2200	1st Video IF Amp Decoup
R23	5600Ω	½			2nd Video IF Amp Grid
R24	68Ω	½			2nd Video IF Amp Cathode
R25	2200Ω	½		BTS-2200	2nd Video IF Amp Decoup
R26	330Ω	½		BTS-330	AGC Network
R27	8200Ω	½			3rd Video IF Amp Grid
R28	68Ω	½			3rd Video IF Amp Cathode
R29	2200Ω	½		BTS-2200	3rd Video IF Amp Decoup
R30	5600Ω	½			4th Video IF Amp Grid
R31	150Ω	½		BTS-150	4th Video IF Amp Cathode
R32	8200Ω	½			4th Video IF Amp Plate
R33	2200Ω	½		BTS-2200	4th Video IF Amp Decoup
R34	4700Ω	½		BTS-4700	Video Det. Diode Load
R35	1Meg	½		BTS-1Meg	AGC Rectifier Diode Load
R36	470KΩ	½		BTS-470K	AGC Network
R37	470KΩ	½		BTS-470K	Voltage Divider
R38	3300Ω	½		BTS-3300	1st Video Amp Cathode
R39	2200Ω	½		BTS-2200	1st Video Amp Plate
R40	1Meg	½		BTS-1Meg	2nd Video Amp Grid
R41	56Ω	1		BW-1-56	2nd Video Amp Cathode
R42	3300Ω	1		BTA-3300	2nd Video Amp Plate
R43	100KΩ	½		BTS-100K	Voltage Divider
R44	470KΩ	½			Sound IF Amp Grid Leak
R45	82Ω	½		BTS-82	Sound IF Amp Cathode
R46	1200Ω	½		BTS-1200	Sound IF Amp Decoup
R47	68Ω	½		BW-½-68	Balancing
R48	18KΩ	½		BTS-18K	Ratio Det Diode Load
R49	18KΩ	½		BTS-18K	Ratio Det. Diode Load
R50	47KΩ	½		BTS-47K	De-Emphasis
R51	10Meg	½		BTS-10Meg	AF Amp Grid
R52	330KΩ	½		BTS-330K	AF Amp Plate
R53	470KΩ	½		BTS-470K	Output Grid
R54	1000Ω	1		BTA-1000	Output Decoup
R55	3900Ω	½		BTS-3900	Isolation
R56	270KΩ	½		BTS-270K	Sync. Clipper Cathode
R57	1.5Meg	½		BTS-1.5Meg	Sync. Clipper Plate
R58	2700Ω	½		BTS-2700	Sync. Sep. Cathode
R59	10KΩ	½		BTS-10K	Sync. Sep. Plate
R60	3900Ω	½		BTS-3900	Sync. Sep. Plate
R61	22KΩ	½		BTS-22K	Intergrator
R62	8200Ω	½		BTS-8200	Intergrator

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
R63	8200Ω	½		BTS-8200	Intergrator
R64	1.5Meg	½		BTS-1.5Meg	Vert. Osc. Grid
R65	100KΩ	½		BTS-100K	Voltage Divider
R66	6.8Meg	½		BTS-6.8Meg	Voltage Divider
R67	220KΩ	½		BTS-220KΩ	Vert. Osc. Grid
R68	2.2Meg	½		BTS-2.2Meg	Vert. Output Grid
R69	390Ω	1		BTA-390	Vert. Output Cathode
R70	8200Ω	½		BTS-8200	Vert. Peaking
R71	270Ω	1		BTA-270	Vert. Output Plate
R72	560Ω	½		BTS-560	Feedback Network
R73	100KΩ	½		BTS-100K	Horiz. Phase Det. Load
R74	100KΩ	½		BTS-100K	Horiz. Phase Det. Load
R75	4.7Meg	½		BTS-4.7Meg	Horiz. Phase Det. Load
R76	470KΩ	½		BTS-470K	Horiz. AFC Filter Network
R77	5600Ω	½		BTS-5600	Horiz. Osc. Plate
R78	1500Ω	½		BTS-1500	Horiz. Osc. Cathode
R79	82KΩ	½		BTS-82K	Horiz. Disc. Grid
R80	180KΩ	½		BTS-180K	Horiz. Disc. Plate
R81	4700Ω	½		BTS-4700	Horiz. Peaking
R82	10KΩ	½		BTS-10K	Horiz. Multivibrator Decoup
R83	68Ω	½			Parasitic Supp.
R84	470KΩ	½		BTS-470K	Horiz. Output Grid
R85	82Ω	2		BW-2-82	Horiz. Output Cathode - Wire Wound
R86	13KΩ	1		BTA-12K	Horiz. Output Screen
R87	56KΩ	½		BTS-56K	Voltage Divider
R88	1Meg	½			HV Filter
R89A	645Ω	20			Bleeder - Wire Wound
B	135Ω	20			Bleeder - Wire Wound
R90A	1150Ω	20			Bleeder - Wire Wound
B	10KΩ	20			Bleeder - Wire Wound
R91	18Ω	½		BW-½-18	Series Dial Light - See Note 2

Note 1 Some Models Use 1000Ω Resistor In This Application.
Note 2 Not Used In All Models.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC ② 1.9A	740VCT .250ADC	5VAC ② 3A	6.3VAC ② 1.2A		P-8315 Two P-6134 ⑤	P-3059 P-2944 ③	TP-355 ④ F-633 ③
			SEC. 4	SEC. 5				
			6.3 VAC ② .6A	6.3 VAC ② 7A				

③ Use For Sec. #3.
④ Drill New Mtg. Holes.
⑤ Mount P-6134's Where Space Permits And Use For Sec. #3 And Sec. #4.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	14Ω	750Ω		A-8111	A-3000	TBO-1	Vert. Block Osc. Trans.
T3	700Ω Tap ② 70Ω	5Ω Tap ④ .5Ω, 4Ω			HVO-6		Hor. Output Trans.
		SEC. 2					
		0Ω					
T4	800Ω Tap ② 10Ω			A-8112	A-3037	TSO-5 ①	Vert. Output Trans.
T5A	5.5Ω			DY-7	MD-70		Hor. Deflection Coil
B	46Ω						Vert. Deflection Coil

① Drill One New Mtg. Hole

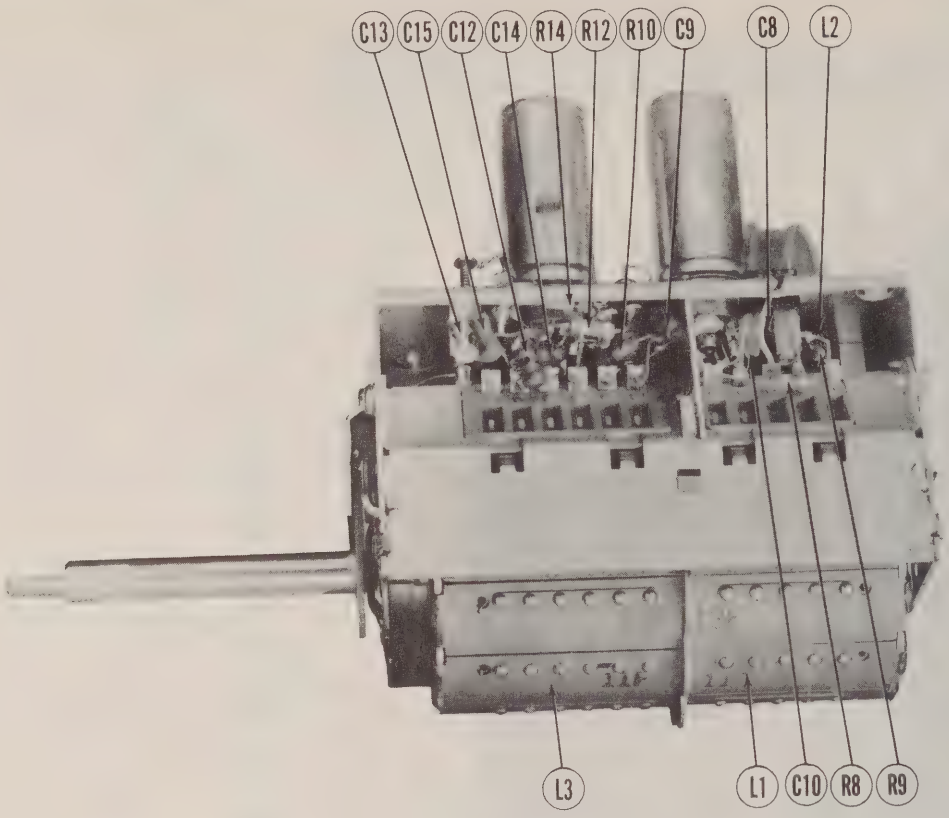
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	INSTALLATION NOTES
T6	7500Ω	3.5Ω	500Ω	.6Ω		A-3878	A-2931	RO-13	

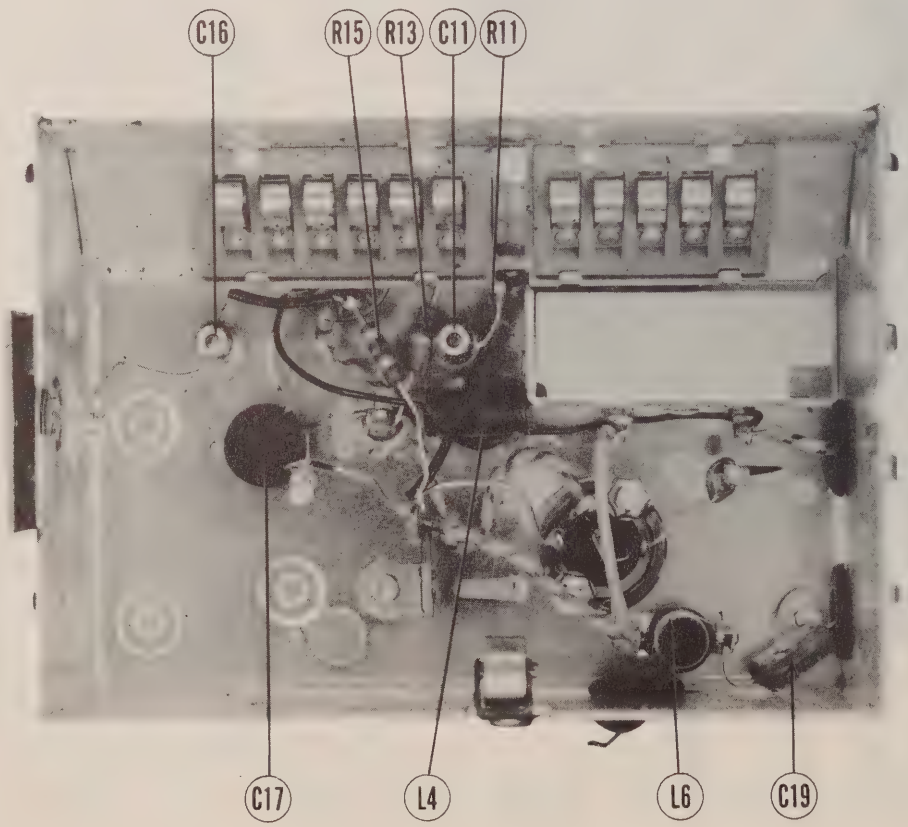
SPEAKER

ITEM No.	RATINGS: FIELD. RES.	RATINGS: V. C. IMP.	REPLACEMENT DATA: DEWALD PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	62Ω	3.5Ω			6E62S ②	② Remount Output Trans.
	CONE DIA.	V. C. DIA.				
SP2	6"	9/16"				

PARTS LIST CONTINUED ON PAGE 15



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	DEWALD PART No.	MEISSNER PART No.	
L1	Ant. Coil	0Ω	0Ω			
L2	Fil. Choke	0Ω				
L3	RF Mixer Grid & Osc. Coils	0Ω				
L4	Fil. Choke	0Ω				
L5	Conv. Trans.	1.8Ω	0Ω			
L6	1st Video IF	1.2Ω				
L7	2nd Video IF	.4Ω				
L8	3rd Video IF	.4Ω				
L9	4th Video IF	.4Ω				
L10	5th Video IF	.4Ω				
L11	Peaking	2.7Ω				36 Microhenries
L12	Peaking	5Ω			19-1921 †	120 Microhenries wound on 22KΩ resistor
L13	Peaking	2.7Ω				36 Microhenries
L14	Peaking	5Ω			19-1921 †	120 Microhenries wound on 22KΩ resistor
L15	Peaking	5Ω			19-1921 †	120 Microhenries wound on 22KΩ resistor
L16	Sound IF	1.8Ω	1.6Ω			
L17	Ratio Det. Trans	5.2Ω	.4Ω			
L18	Horiz. Freq. Coil	45Ω				
L19	Horiz. Lin.	30Ω				
L20	Width Coil	.3Ω				

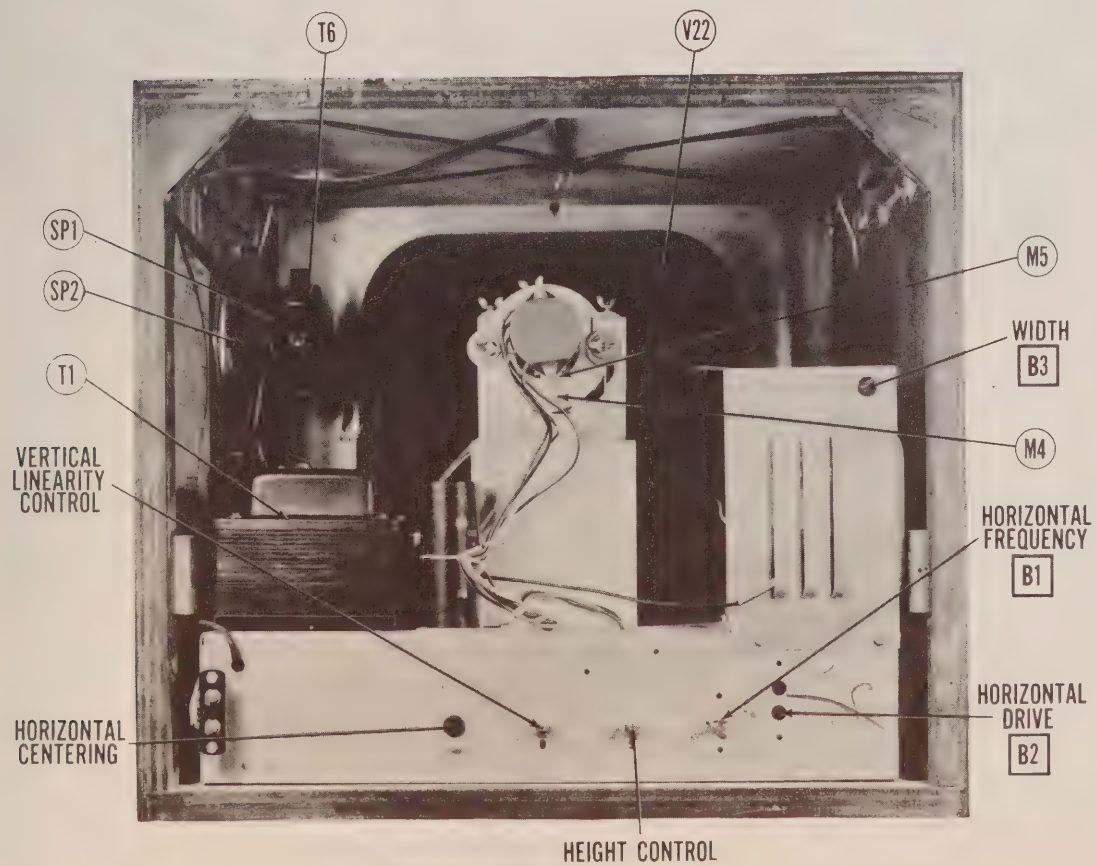
† Parallel With 22KΩ Resistor

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					DEWALD PART No.		
M1	Bayonet	6-8	.15	Brown			Type Number 47 - Not Used In All Models

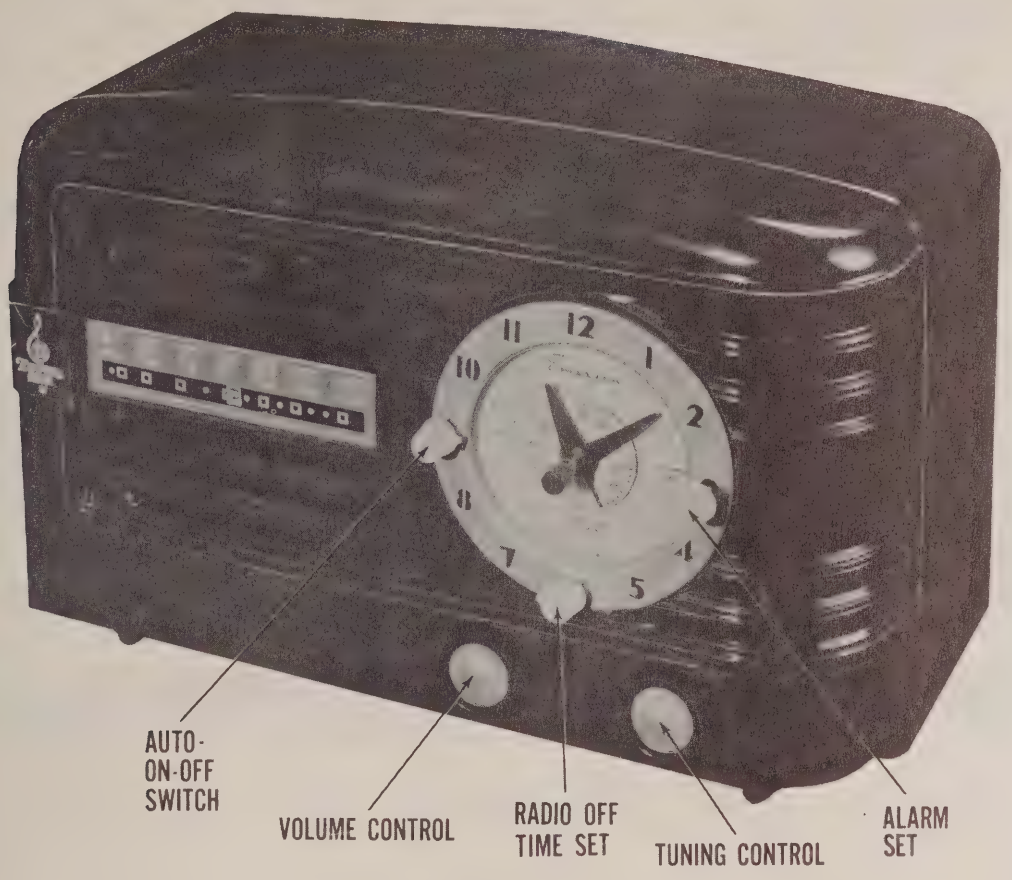
MISCELLANEOUS

ITEM No.	PART NAME	DEWALD PART No.	NOTES
M2	RF Tuner		
M3	Fuse		.2A 250V Type 3AG
M4	Focus Magnet		
M5	Ion Trap		
B2	Trimmer		Horizantal Drive 40-370MMF



CABINET-REAR VIEW

EMERSON
MODEL 671B (Ch. 120137-B)



EMERSON
MODEL 671B (Ch. 120137-B)

EMERSON MODEL 671B

TRADE NAME	Emerson, Model 671B (Ch. 120137-B)
MANUFACTURER	Emerson Radio And Phonograph Corp., 111 8th Ave., New York, New York.
TYPE SET	AC Operated Superheterodyne Receiver With Electric Clock
TUBES(FIVE)	Types 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 50C5 Power Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial pointer, turn tuning gang fully closed and set pointer to the calibration mark near the left hand end of the dial backplate.
Use isolation transformer if available. If not connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.001MFD	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400Ω Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4,	Adjust for maximum output.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1950 by Howard W. Sams & Co., Inc., Indianapolis, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

EMERSON MODEL 671B

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
V1	Converter	12BE6	12BE6	7CN	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det.-AVC-AF	12AT6	12AT6	7BT	
V4	Power Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	30	150	925061	PRS150/50-30		EDL5315		TVA-2450	Filter Red
B	50	150							Filter Green
C2	.05	400	920030	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C3A	220		470310	SI220	D6-221	5W5T25	GP2K-220		Diode RF Filter
B	2000			BPD-002	DD-202	PTE6D2	801-002	34C3	Audio Coupling
C	220			SI-220	D6-221	5W5T25	GP2K-220		AF Amp. Plate
D	5000			BPD-005	DD-502	PTE6D5	811-005		Audio Coupling
C4	.02	400	920540	P488-02	DF-203	PTE4S2		4TM-S2	Output Plate Bypass
C5	.1	200	920040	P288-1	DF-104	PTE4P1		2TM-P1	Line Isolation
C6	.047	400	922101	P488-047	DF-503	PTE4S5		4TM-S47	Line Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	390177	Q11-133	AG-58-S	AN-59	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R1A per instructions

RESISTORS

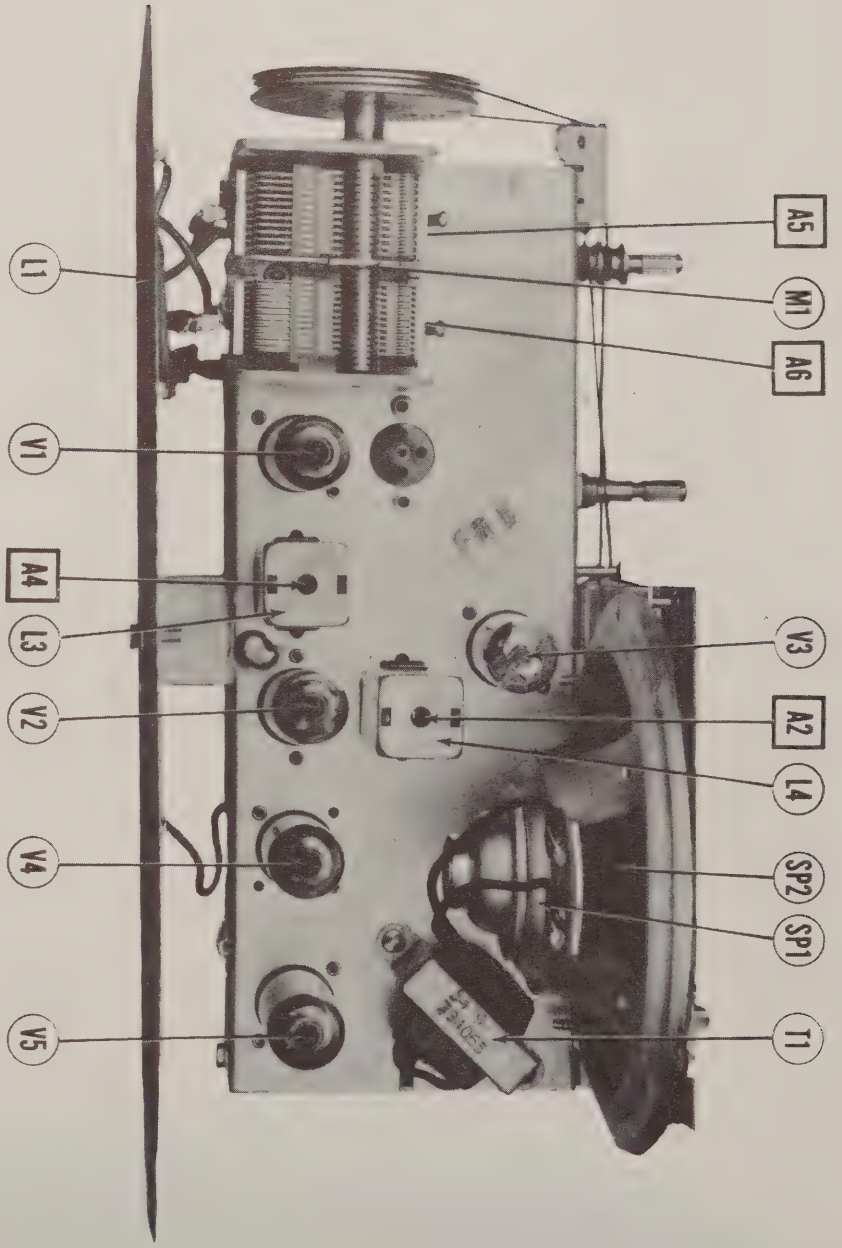
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	IDENTIFICATION CODES
R2	22KΩ	1	*716064		Osc. Grid
R3	120Ω	½	340272	BTS-120	IF Amp. Cathode
R4	3.3Meg	½	351330	BTS-3.3Meg	AVC Network
R5	10Meg	½	351450	BTS-10Meg	AF Amp. Grid
R6	470KΩ	½	351130	BTS-470K	AF Amp. Plate
R7	470KΩ	½	351130	BTS-470K	Output Grid
R8	150Ω	½	340292	BTS-150	Output Cathode
R9	1500Ω	1	380532	BTA-1500	Filter
R10	18Ω	½	340072		Rectifier Ballast

* Item R2 And L2 Are Both Included In This Part Number.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T1	2KΩ	3.2Ω	192Ω	.7Ω	734065	A-3332	A-3025	R0-2 ①	Drill One New Mtg. Hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

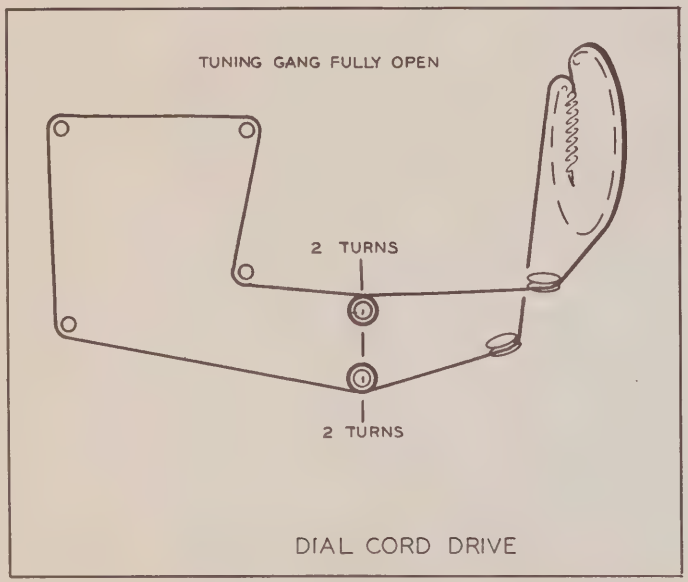
ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	EMERSON PART No.	VIKING PART No.	QUAM PART No.	
SP1	PM	3.2Ω	180079	5J4	5A07	
	CONE DIA.	V. C. DIA.				
SP2	4 3/4"	9/16"				

R F COILS

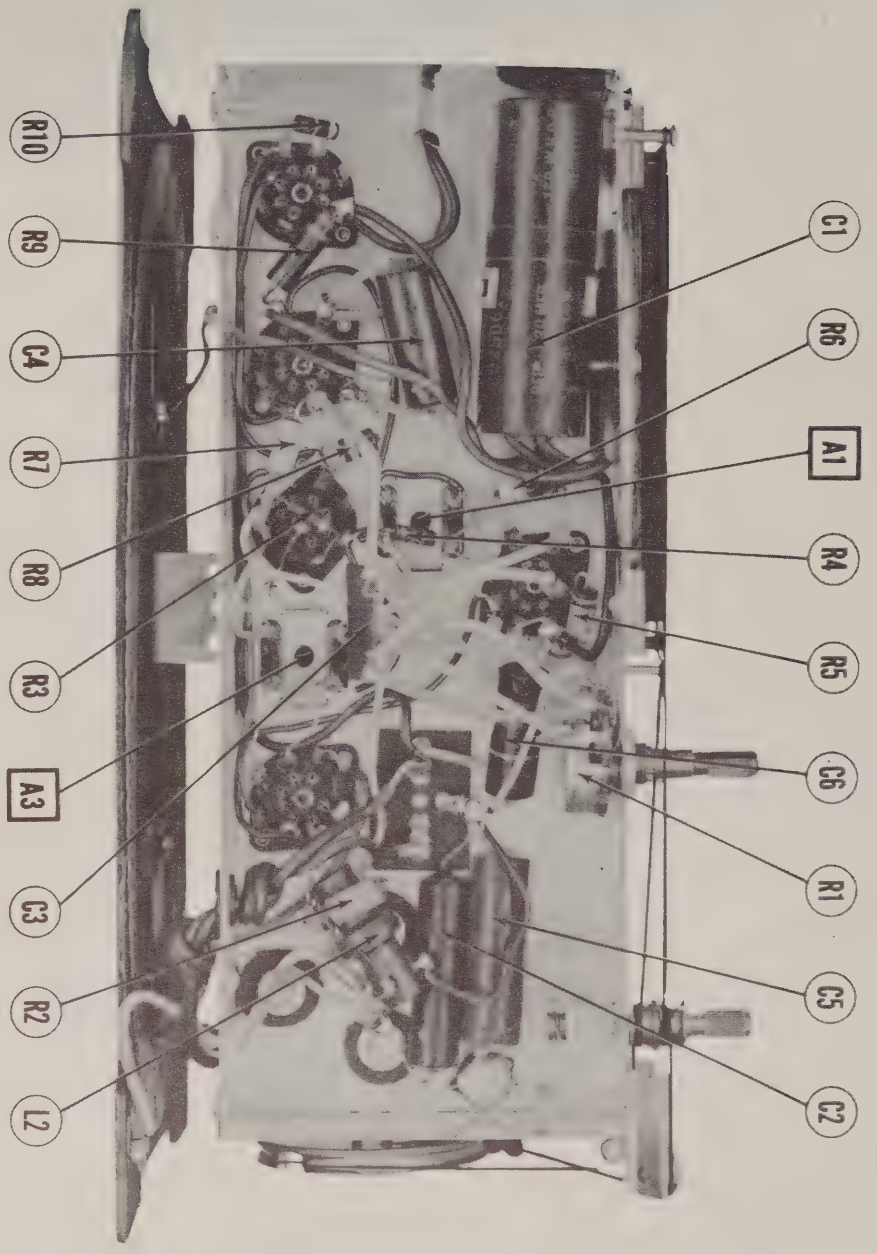
ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	EMERSON PART No.	MEISSNER PART No.	
L1	Loop Ant.	3.4Ω		700057		
L2	Osc. Coil	.5Ω	5Ω	716054	14-1073 *	Includes R2 * Add R2
L3	1st IF	18Ω	18Ω	720033	16-6758	
L4	2nd IF	18Ω	18Ω	720033	16-6758	

MISCELLANEOUS

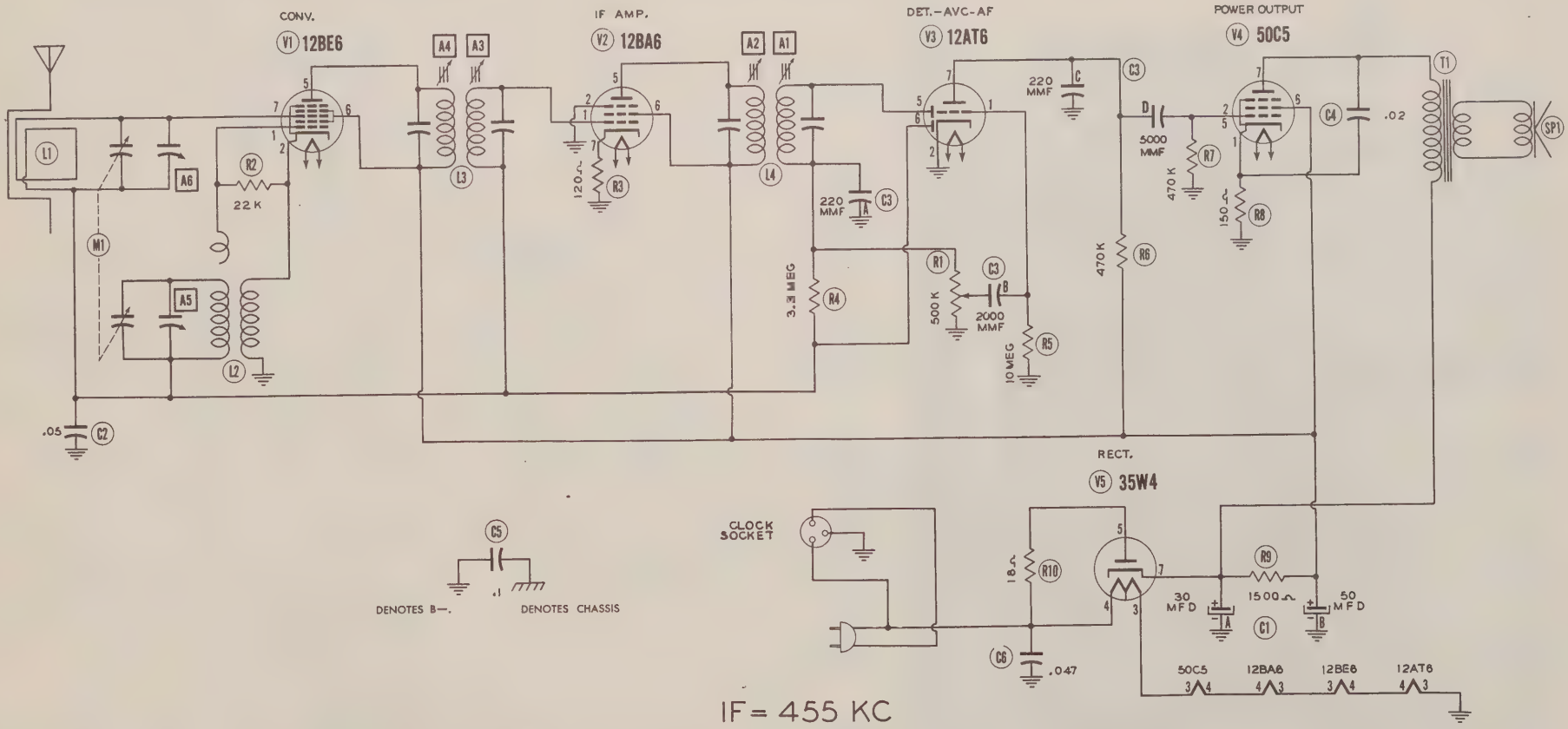
ITEM No.	PART NAME	EMERSON PART No.	NOTES
M1	2 Gang Var. Cap.	900082	(36-456 MMF, 20-245 MMF)
	Cabinet	140387	
	Knob	460162S	
	Clock	470653	



CHASSIS—BOTTOM VIEW



EMERSON MODEL 671B



IF = 455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	§-6.6VDC	0V	27VAC	13VAC	85VDC	85VDC	-.3VDC
V 2	12BA6	-.3VDC	0V	27VAC	40VAC	85VDC	85VDC	1.2VDC
V 3	12AT6	-.4VDC	0V	0V	13VAC	-.2VDC	-.3VDC	42VDC
V 4	50C5	5.4VDC	0V	90VAC	40VAC	0V	85VDC	110VDC
V 5	35W4	0V	0V	90VAC	117VAC	115VAC	112VAC	115VDC

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.5Ω	26Ω	13Ω	†1.5KΩ	†1.5KΩ	3.8Meg
V 2	12BA6	3.8Meg	0Ω	26Ω	38Ω	†1.5KΩ	†1.5KΩ	150Ω
V 3	12AT6	10Meg	0Ω	0Ω	13Ω	500KΩ	3.8Meg	†470KΩ
V 4	50C5	150Ω	470KΩ	85Ω	38Ω	470KΩ	†1.5KΩ	†190Ω
V 5	35W4	Inf.	Inf.	85Ω	120Ω	140Ω	110Ω	55KΩ

† MEASURED FROM PIN 7 OF V5

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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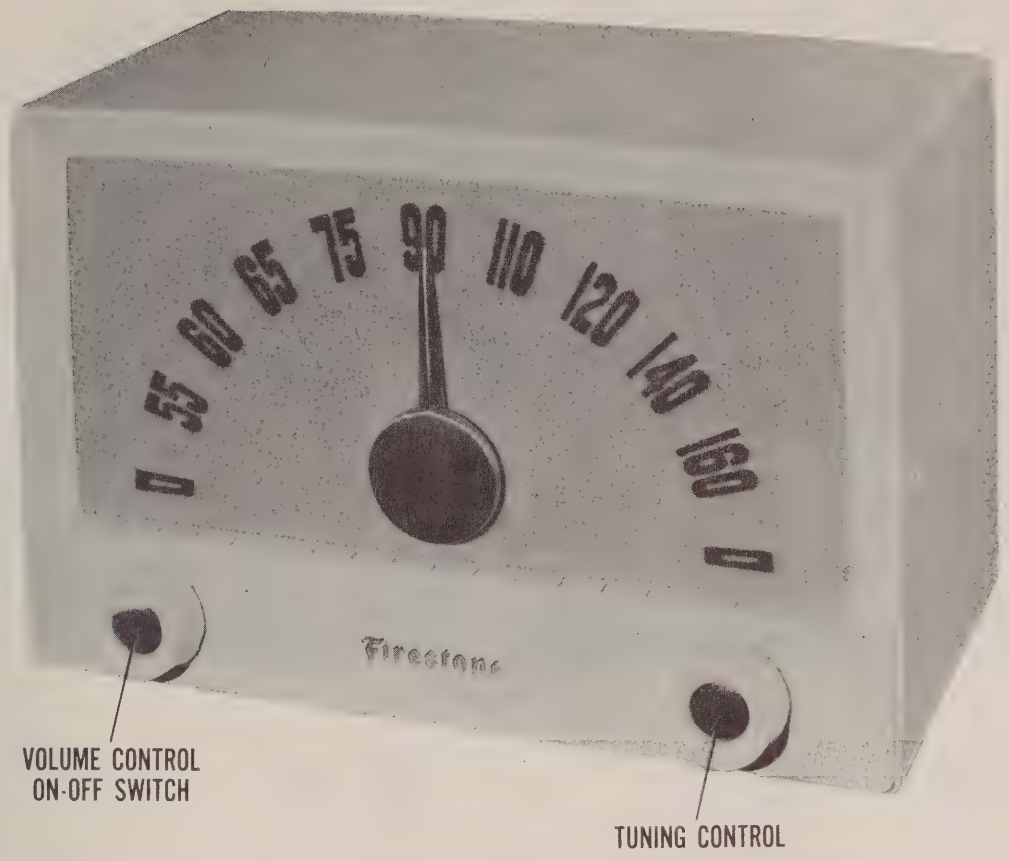
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

FIRESTONE
MODELS 4-A-85, 4-A-89



FIRESTONE
MODELS 4-A-85, 4-A-89

FIRESTONE MODEL 4-A-89

TRADE NAME Firestone, Models 4A-85, 4A-89 (Code No. 297-0-3123)
MANUFACTURER Firestone Tire and Rubber Co., Akron, Ohio
TYPE SET AC-DC Operated Superheterodyne Receiver With Loop Antenna.
TUBES (Six) Types 12AU7 Mixer, 6C4 Oscillator, 12BA6 1F Amp., 12AV6 Det - AVC-AF, 50C5 Power Output, 35W4 Rectifier

POWER SUPPLY 110-120 Volts AC-DC RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST 540-1620 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap fully closed and set pointer parallel with base of dial.
Use isolation transformer if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.02 MFD	High side to stator on rear section of tuning gang. Low side toB-.	455KC (400Ω Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4,	Adjust for maximum output.
2.		Loop	1620KC	"	"	A5,	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune for max. output	"	A6,	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

FIRESTONE
MODEL 4-A-89

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		FIRESTONE PART No.	STANDARD REPLACEMENT		
V1	Mixer	12AU6	12AU6	7BK	
V2	Oscillator	6C4	6C4	6BG	
V3	IF Amp.	12BA6	12BA6	7BC	
V4	Det.-AVC-AF	12AV6	12AV6	7BT	
V5	Power Output	50C5	50C5	7CV	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	FIRESTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	150	N-5051	PRS150/40-40		EDL4415		TVA-2445	Filter Blue
B	40	150							Filter Red
C2	.01	400	N-1344	P488-01	D6-103	PTE4S1	811-01	4TM-S1	RF Coupling
C3	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-S5	Isolation
C4	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-S5	AVC Filter
C5	.05	200	N-1345	P288-05	DF-503	PTE4S5		2TM-S5	Mixer Decoupling
C6	100		N-6015	SI100	D6-101	5W5T1	GP1K-100	19C11	Diode RF Filter
C7	.005	600	N-4894	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C8	250		N-6488	SI250	D6-251	5W5T25	GP2K-250	19C13	AF Amp. Plate
C9	.01	400	N-1344	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Audio Coupling
C10	.02	400	N-1376	P488-02	DF-203	PTE4S2		4TM-S2	Output Plate Bypass
C11	.08	200	N-8092	P288-1	DF-104	PTE4P1		72P52	Line Isolation
C12	.05	400	N-1346	P488-05	DF-503	PTE4S5		4TM-S5	Rect. Plate Bypass

CONTROLS

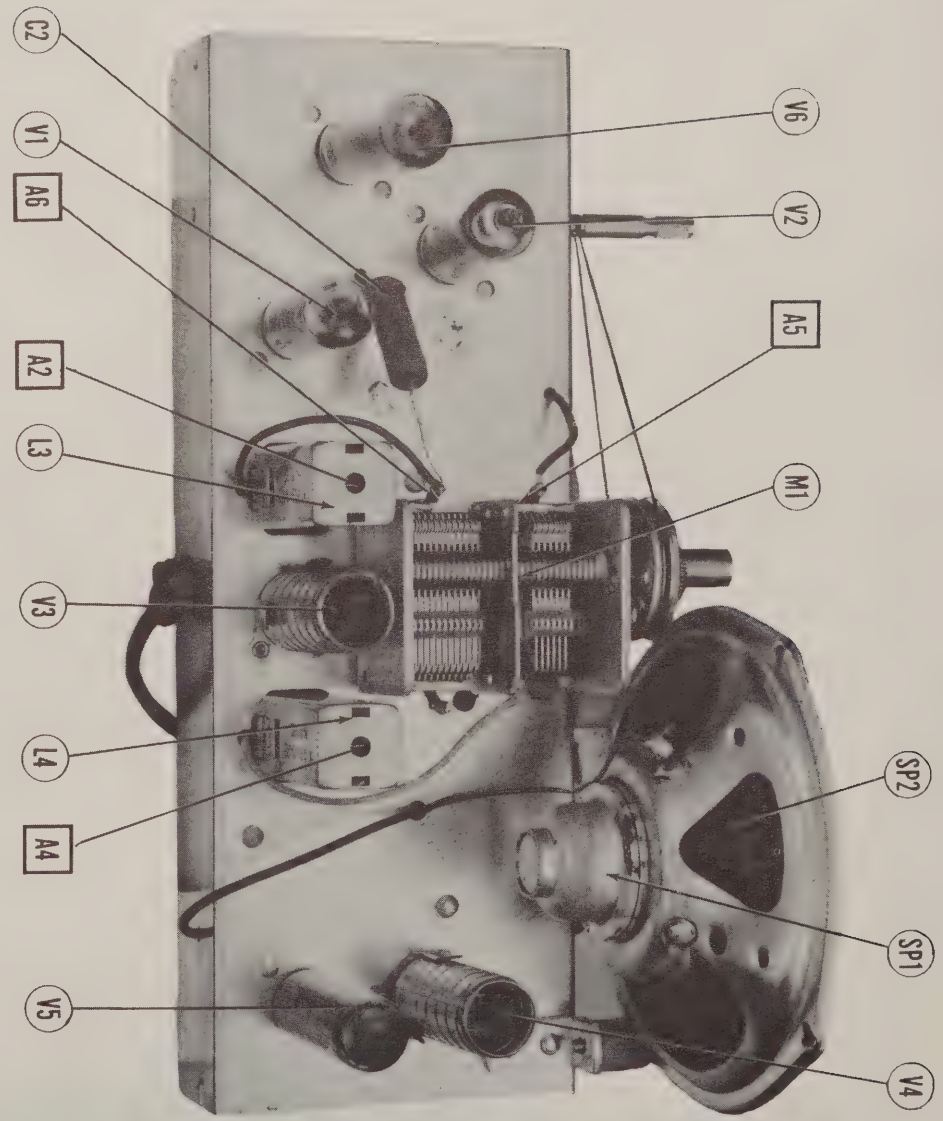
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	FIRESTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	N-7984	Q13-133	AM-60-Z	BSK-60-S	Volume Control
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Attach to R1A Per Instructions.
C	Switch		Not Req.	76-1	SW-A	Not Req.	Attach to R1A Per Instructions.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	FIRESTONE PART No.	IRC PART No.	
R2	3.3Meg.	½	N-4062		RF Amp Grid
R3	56KΩ	½			Osc. Grid - See Note 1
R4	56KΩ	½		BTS-56K	Mixer Decoup - See Note 1
R5	1Meg	½	N-1262	BTS-1Meg	AVC Network
R6	68Ω	2	N-6485		IF Amp. Cathode
R7	4.7Meg	½		BTS-4.7Meg	AF Amp. Grid - See Note 2
R8	220KΩ	½	N-4026	BTS-220K	AF Amp. Plate
R9	470KΩ	½	N-4027	BTS-470K	Output Grid
R10	180Ω	½	N-4067	BTS-180	Output Cathode - See Note 3
R11	1000Ω	1	N-3341	BTA-1000	Filter

Note 1. Some Models Use 47KΩ Resistor In This Application.
Note 2. Some Models Use 6.8 Meg Resistor In This Application.
Note 3. Some Models Use Resistors In Parallel To Obtain Desired Resistance.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		FIRESTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2000Ω	3Ω	160Ω Tap ⓐ 6Ω	.3Ω	N-8001	A-3330	A-3031	R0-3	

SPEAKER

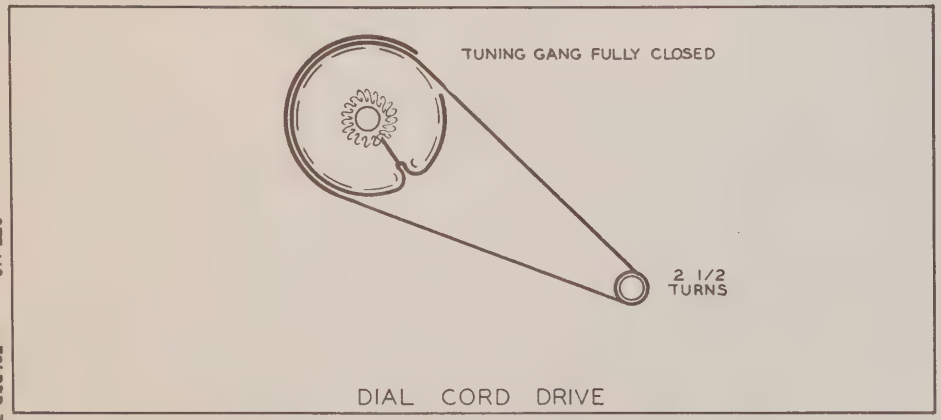
ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			FIRESTONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	FIELD: PM	V.C. IMP: 3Ω	N-7980	ST-105 Mod. P5-X	5A07	
SP2	CONE DIA.: 4½	V.C. DIA.: 9/16				

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	FIRESTONE PART No.	MEISSNER PART No.	
L1	Loop Antenna	.2Ω	2.3Ω	N-7964		Includes Cabinet Back
L2	Osc. Coil	5.4 Ω	8.2Ω	N-7982	14-1073	Primary Tapped At .4Ω
L3	1st IF	18Ω	18Ω	N-7981	16-6758	
L4	2nd IF	18Ω	18Ω	N-7981	16-6758	

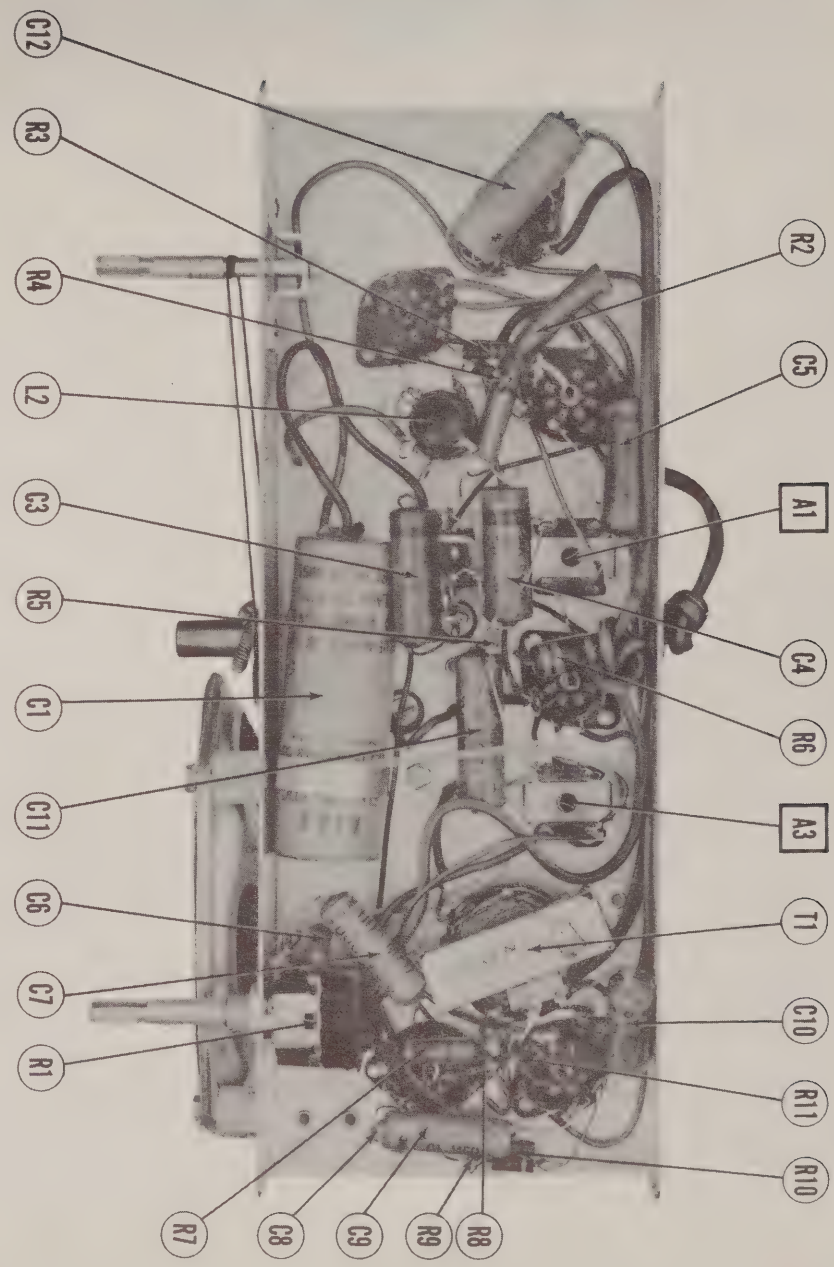
MISCELLANEOUS

ITEM No.	PART NAME	FIRESTONE PART No.	NOTES
M1	2 Gang Var. Cap.	N-8045	(23-397 MMF, 20-153MMF)
	Knob	N-7990	Model 4-A-85
	Knob	N-7989	Model 4-A-89
	Cabinet	313	Model 4-A-85
	Cabinet	312	Model 4-A-89
	Dial Pointer	N-7994	

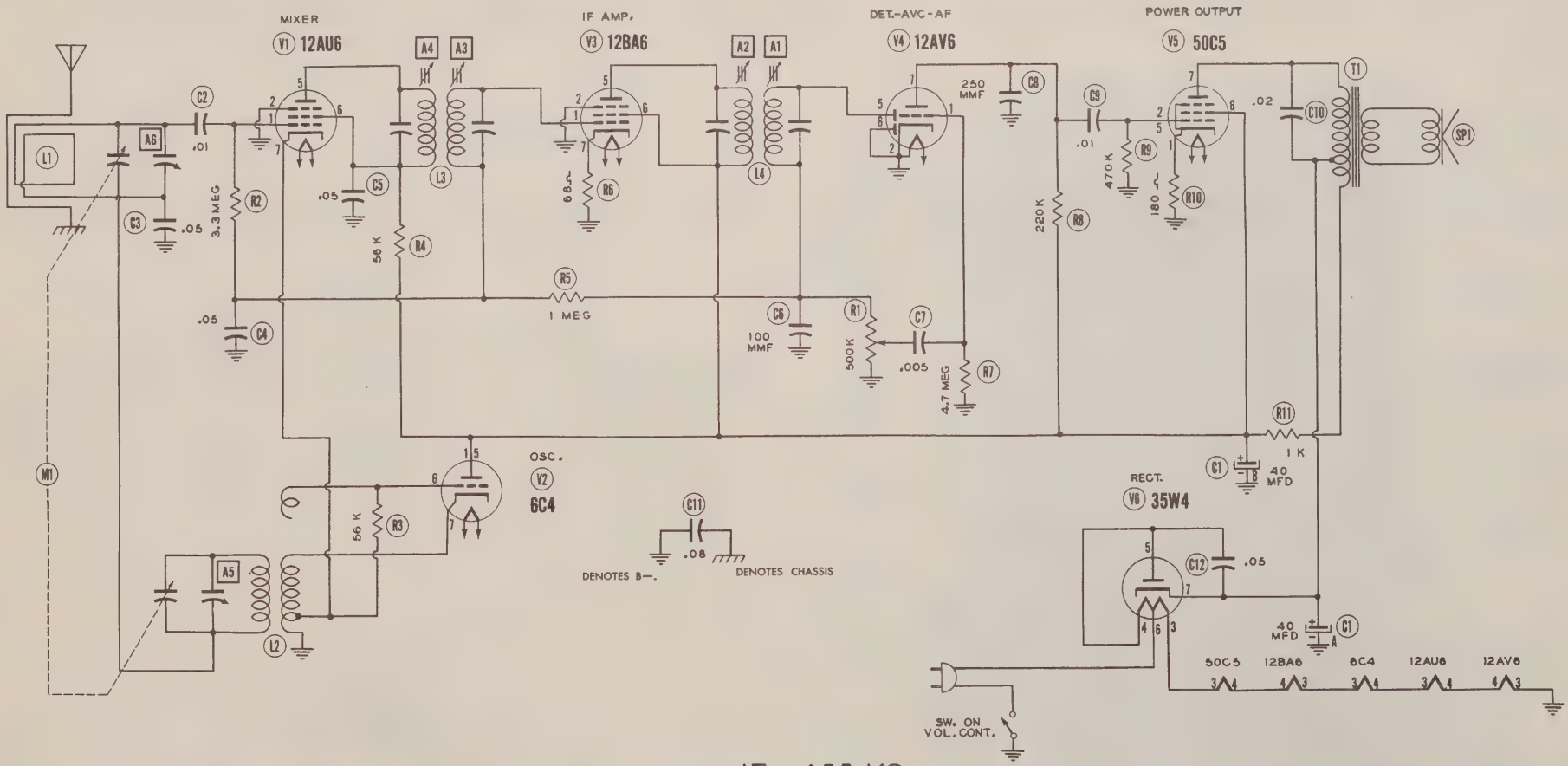


SET 118 FOLDER 7

CHASSIS—BOTTOM VIEW



FIRESTONE MODEL 4-A-89



IF = 455 KC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	-1.7VDC	0V	24VAC	13VAC	50VDC	50VDC	0V
V 2	6C4	95VDC	0V	30VAC	24VAC	95VDC	§-10.5VDC	0V
V 3	12BA6	-.3VDC	0V	30VAC	41VAC	95VDC	95VDC	1VDC
V 4	12AV6	-.6VDC	0V	0V	13VAC	-.4VDC	0V	65VDC
V 5	50C5	7.5VDC	0V	90VAC	41VAC	0V	95VDC	110VDC
V 6	35W4	0V	0V	90VAC	110VAC	110VAC	117VAC	115VAC

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12AU6	4.8Meg	0Ω	24Ω	13Ω	†56KΩ	†56KΩ	14Ω
V 2	6CU	†1KΩ	Inf.	30Ω	24Ω	†1KΩ	56KΩ	5.4Ω
V 3	12BA6	1.5Meg	0Ω	30Ω	40Ω	†1KΩ	†1KΩ	68Ω
V 4	12AV6	4.7Meg	0Ω	0Ω	13Ω	500KΩ	0Ω	†220KΩ
V 5	50C5	180Ω	470KΩ	85Ω	40Ω	470KΩ	†1KΩ	†155Ω
V 6	35W4	Inf.	Inf.	85Ω	120Ω	120Ω	110Ω	120KΩ

† MEASURED FROM PIN 7 OF V6

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A PHOTOFACT STANDARD NOTATION SCHEMATIC

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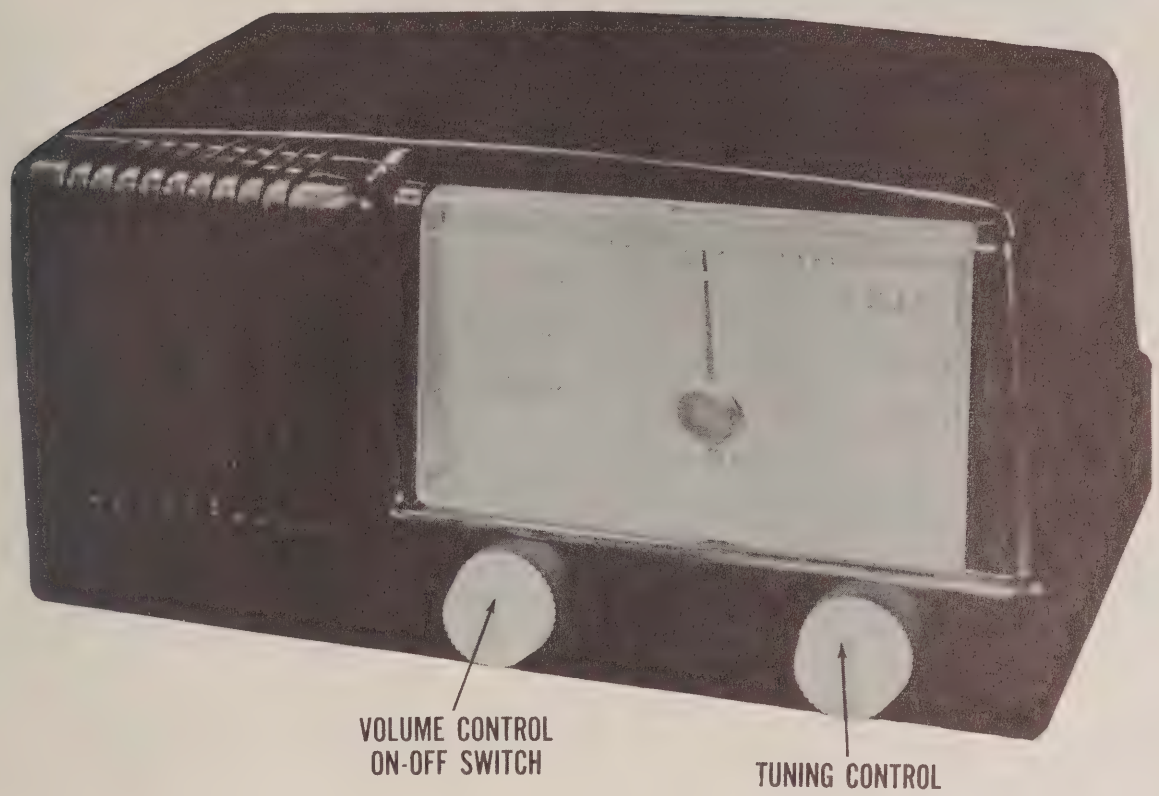
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

GENERAL ELECTRIC
MODELS 400, 401, 411



GENERAL ELECTRIC
MODELS 400, 401, 411

GENERAL ELECTRIC MODEL 400

TRADE NAME	General Electric, Models 400, 401, 411
MANUFACTURER	General Electric Co., Electronic Dept., Electronics Park, Syracuse, New York
TYPE SET	AC-DC Operated Superheterodyne Receiver With Loop Antenna.
TUBES (FIVE)	Types 12SA7 Converter, 12BA6 IF Amp., 12SQ7 Det.-AVC-AF, 50C5 Power Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC
RATING	.24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning cap. fully closed and set pointer to last reference mark at low frequency end of dial.
Use isolation transformer if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to stator on rear section of tuning gang. Low side to B-.	455KC (400Ω Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4,	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1500KC	"	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

GENERAL ELECTRIC
MODEL 400

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		G. E. PART No.	STANDARD REPLACEMENT		
V1	Converter	12SA7	12SA7	8R	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
V4	Power Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	G. E. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	30	150	RCE-046	PRS150/30-30		EDL3315		TVA-2434	Filter Red
B	30	150							Filter Yellow
C2	.05	400	UCC-045	P488-05	DF-503	PTE4S5		4TM-S5	AVC Filter
C3	47	500	UCC-020	1468-00005	D6-470	5W5Q5	GP1K-47	IFM-45	Osc. Grid Cap
C4A	220		RCW-3013	SI220	D6-221	5W5T25	GP2K-220		Diode RF Filter
B	2000			BPD-002	DD-202	PTE6D2	801-002	34C3	Audio Coupling
C	220			SI220	D6-221	5W5T25	GP2K-220		AF Amp. Plate
D	5000			BPD-005	DD-502	PTE6D5	811-005		Audio Coupling
C5	.02	600	UCC-041	P688-02	DF-203	PTE6S2		6TM-S2	Output Plate Bypass
C6	.05	400	UCC-045	P488-05	DF-503	PTE4S5		72P51	Line Isolation
C7	.05	600	UCC-045	P688-05	DF-503	PTE6S5		6TM-S5	Line Filter

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	G. E. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	
R1A	500KΩ	½	RRC-106	Q13-133	AG-60-Z	B-60-S	Volume control
B	Shaft		Not Req.	Not Req.	KSS-3	* AK-16	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	Not Req.	Attach to R1A per instructions

* Use Coupler And Part Of Original Shaft

RESISTORS

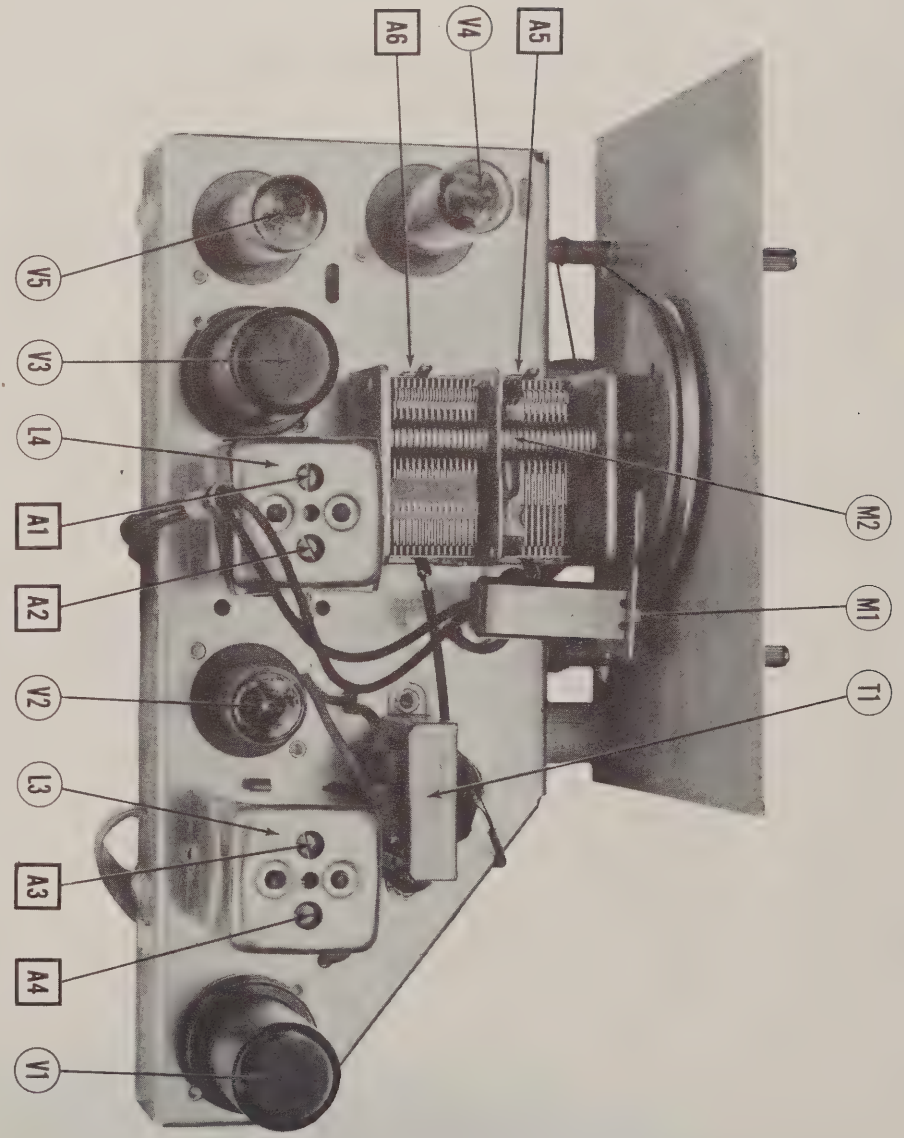
ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	G. E. PART No.	IRC PART No.	
R2	22KΩ	½	URD-081		Osc. Grid
R3	1.5Meg	½		BTS-1Meg	AVC Network - See Note 1
R4	47Ω	½	URD-017		IF Amp. Cathode
R5	4.7Meg	½	URD-137	BTS-4.7Meg	AF Amp. Grid
R6	470KΩ	½	URD-113	BTS-470K	AF Amp. Plate
R7	1Meg	½	URD-121	BTS-1Meg	Output Grid
R8	150Ω	½	URD-029	BTS-150	Output Cathode
R9	1500Ω	2	URF-053	BTB-1500	Filter
R10	15Ω	½			Surge Limiter - See Note 2
R11	470KΩ	½	URD-113	BTS-470K	Isolation

Note 1 Some Models Use 2.2Meg Resistor In This Application
Note 2 Some Models Use 22Ω Resistor In This Application

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		G. E. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T1	2.1KΩ	3.4Ω	225Ω	.6Ω	RTO-069	A-3332	A-3025	R0-2 ①	① Drill One New Mtg. Hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	G. E. PART No.	JENSEN PART No.	QUAM PART No.	
SP1	PM	3.4Ω	S403D	ST-113 Model P4-X	4A07	
	CONE DIA.	V. C. DIA.				
SP2	4"	9/16"				

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		
		PRI.	SEC.	G. E. PART No.	MEISSNER PART No.	
L1	Loop Antenna	3.7		RAB-095		Includes cabinet back
L2	Osc. Coil	.5Ω	7Ω	RLC-090		
L3	1st IF	17Ω	17Ω	RTL-094		
L4	2nd IF	22Ω	22Ω	RTO-095		

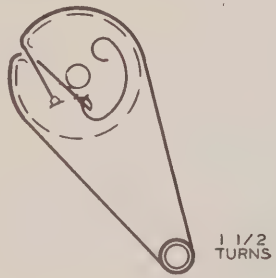
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					G.E. PART No.		
M1	Bayonet	6-8	.2	White			Type #51

MISCELLANEOUS

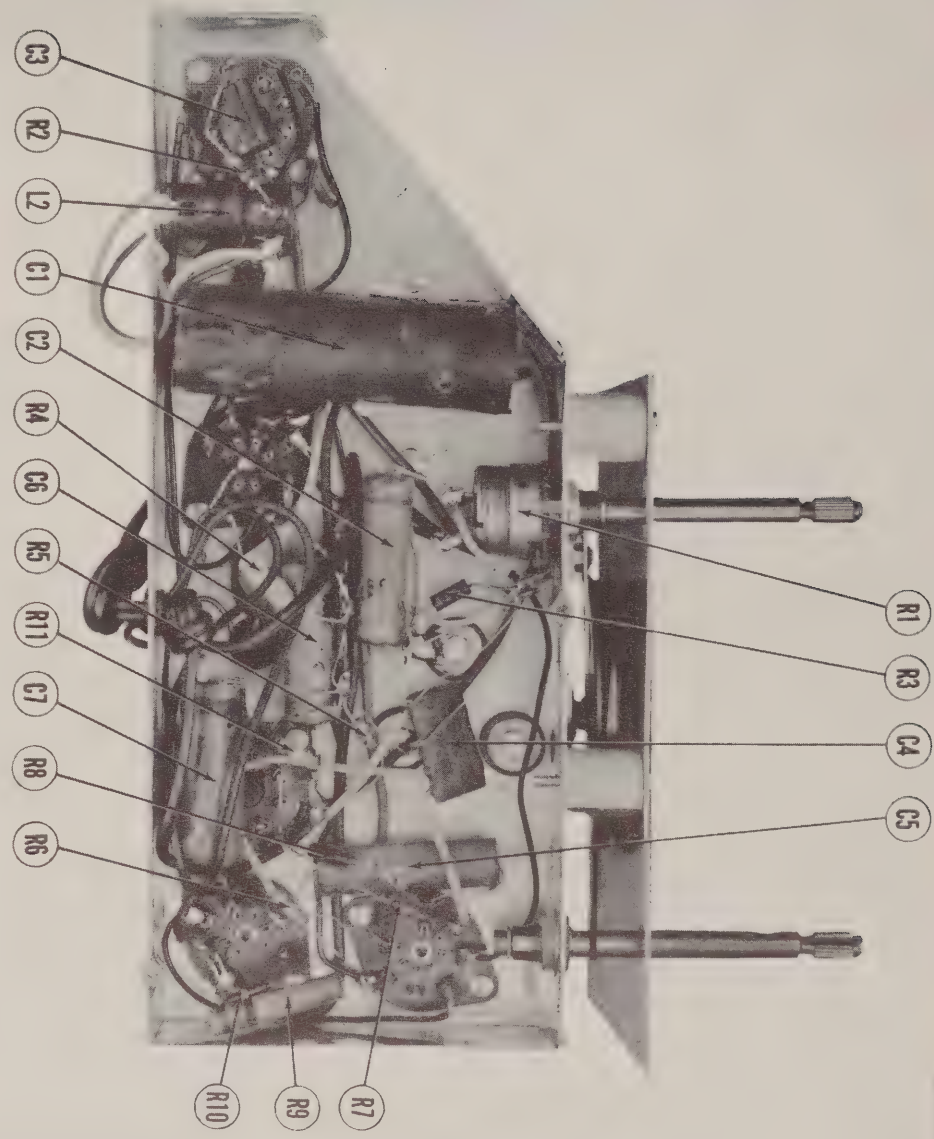
ITEM No.	PART NAME	G. E. PART No.	NOTES
M2	2 Gang Var. Cap.	RCT-042	(21-462 MMF, 21-156 MMF)
	Dial Pointer	RDP-052	
	Knob	RDK-174	Model 400
	Knob	RDK-175	Model 401, 411
	Cabinet	RAU-306	Model 400
	Cabinet	RAU-307	Model 401
	Cabinet	RAU-321	Model 411

TUNING GANG FULLY CLOSED

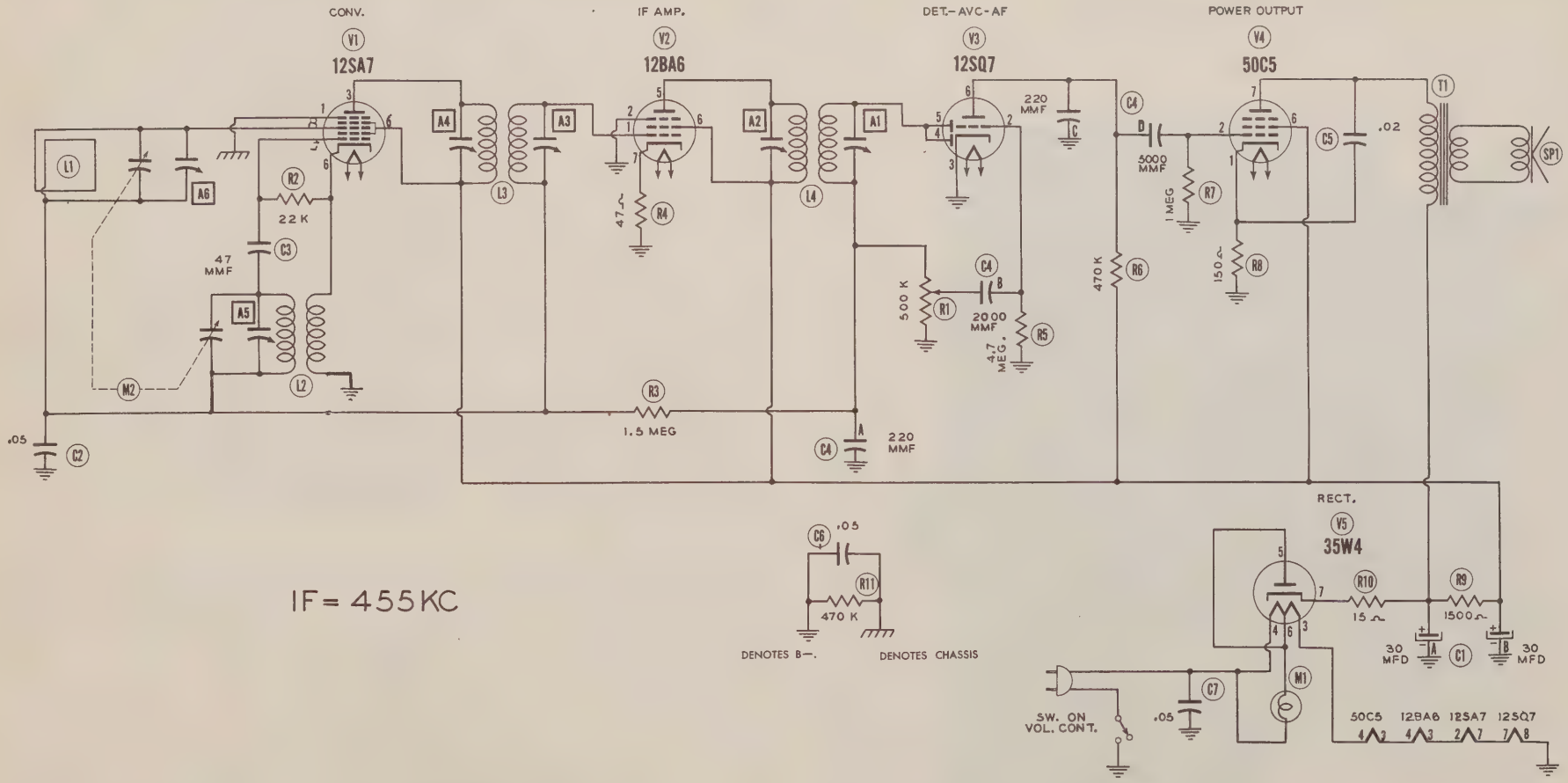


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW



GENERAL ELECTRIC MODEL 400



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	0V	25VAC	85VDC	85VDC	§-8VDC	0V	12VAC	-.4VDC
V 2	12BA6	-.4VDC	0V	25VAC	37VAC	85VDC	85VDC	.5VDC	
V 3	12SQ7	0V	-.8VDC	0V	-1VDC	-1VDC	50VDC	12VAC	0V
V 4	50C5	5.6VDC	0V	37VAC	85VAC	0V	85VDC	110VDC	
V 5	35W4	115VDC	115VDC	85VAC	117VAC	112VAC	112VAC	117VDC	

§ TAKEN WITH VACUUM TUBE VOLTMETER

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12SA7	470KΩ	25Ω	†1.5KΩ	†1.5KΩ	22KΩ	.5Ω	12Ω	2Meg
V 2	12BA6	2Meg	0Ω	25Ω	35Ω	†1.5KΩ	†1.5KΩ	47Ω	
V 3	12SQ7	470KΩ	4.7Meg	0Ω	500KΩ	500KΩ	†470KΩ	12Ω	0Ω
V 4	50C5	150Ω	1Meg	35Ω	85Ω	1Meg	†1.5KΩ	†240Ω	
V 5	35W4	†15Ω	†15Ω	85Ω	120Ω	110Ω	110Ω	40KΩ	

† MEASURED FROM PIN 7 OF V5

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A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

SILVERTONE MODEL
112 (CH. 478.289)

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SILVERTONE MODEL
112 (CH. 478.289)

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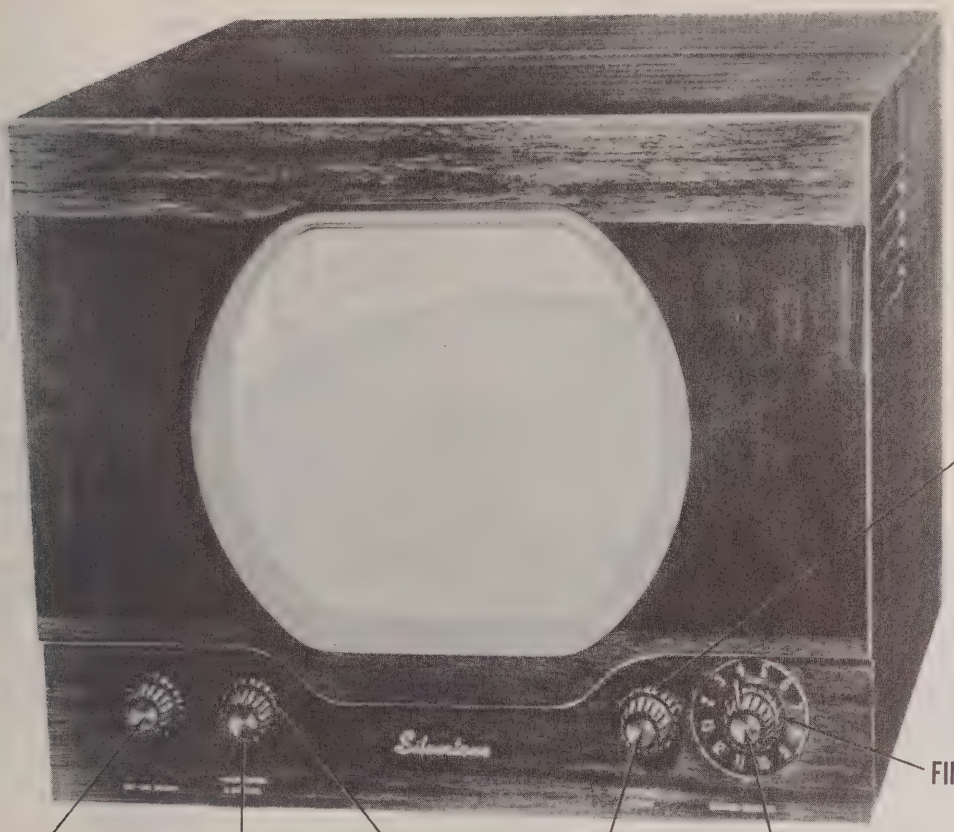
SILVERTONE
MODEL 112 (Ch. 478.289)



SILVERTONE
MODEL 112 (Ch. 478.289)

SILVERTONE MODEL 112

TRADE NAME	Silvertone, Model 112 (Ch. 478.289
SUPPLIER	Sears, Roebuck And Company, 925 S. Homan St., Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Twenty-Two
POWER SUPPLY	110-120 Volts AC
RATING	1.67 Amp. @ 117 Volts AC
TUNING RANGE—Channels 2 thru 13	

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HOWARD W. SAMS & CO., INC. • Indianapolis Indiana

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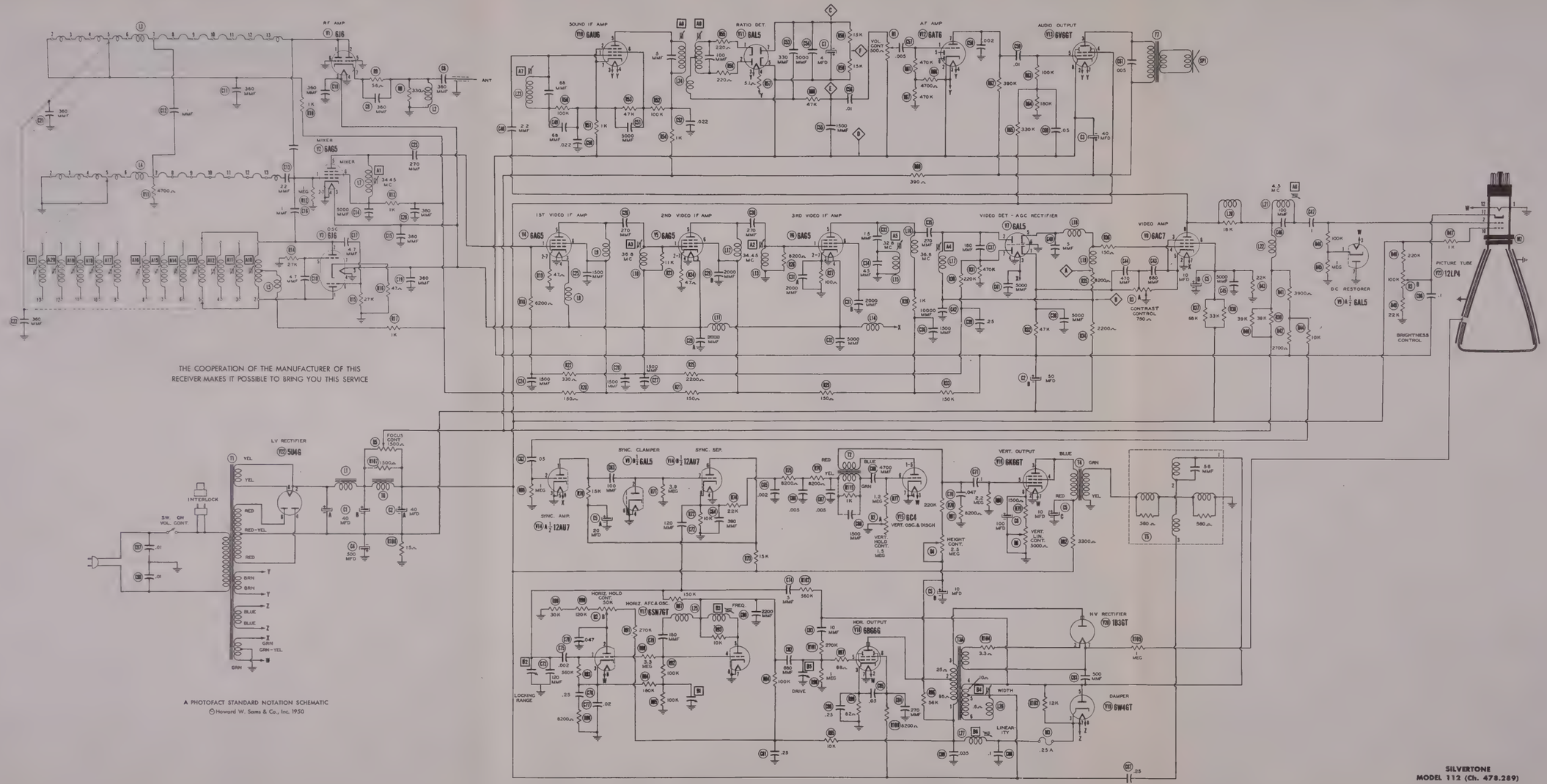

SILVERTONE
MODEL 112 (Ch. 478.289)

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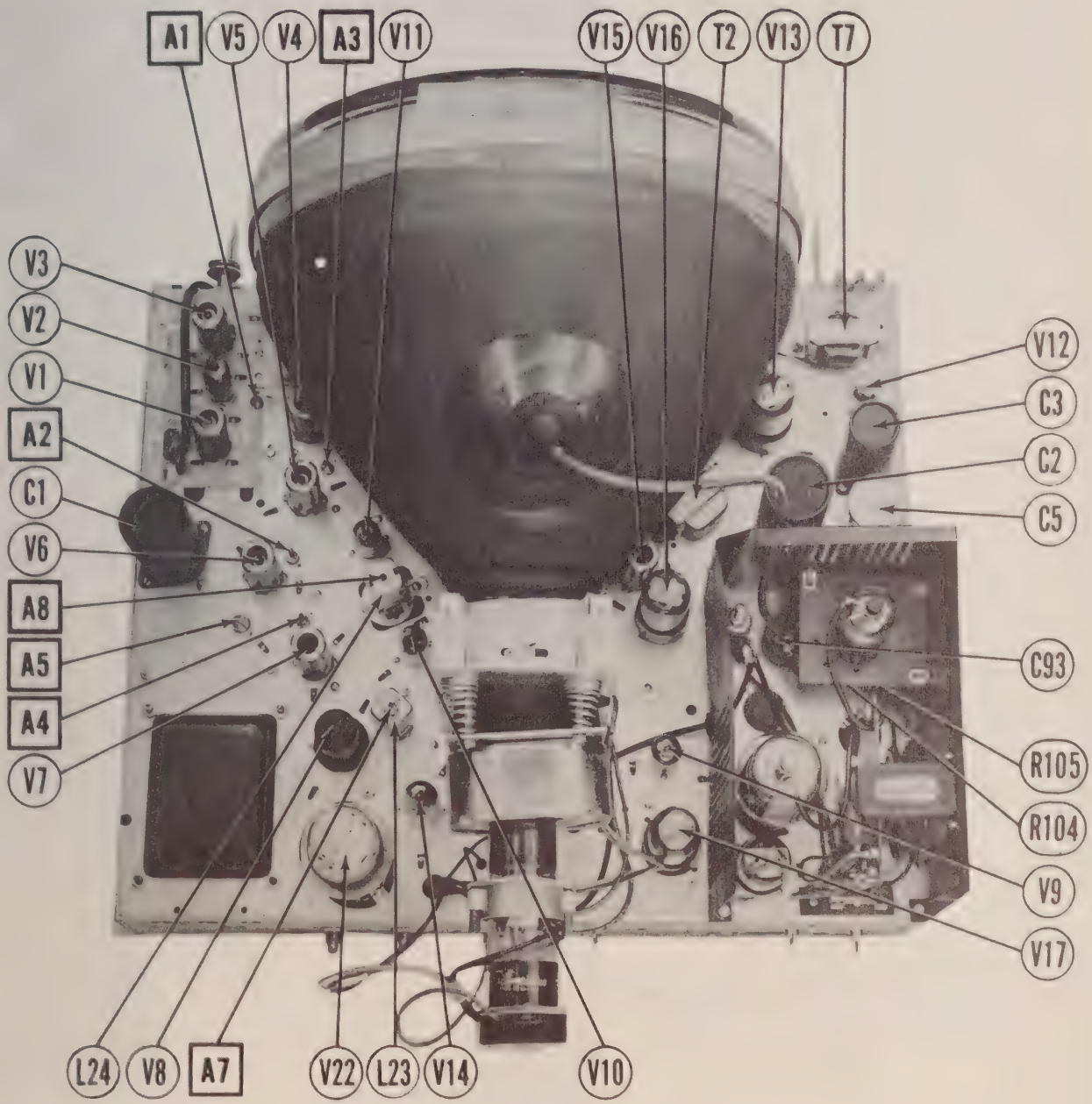
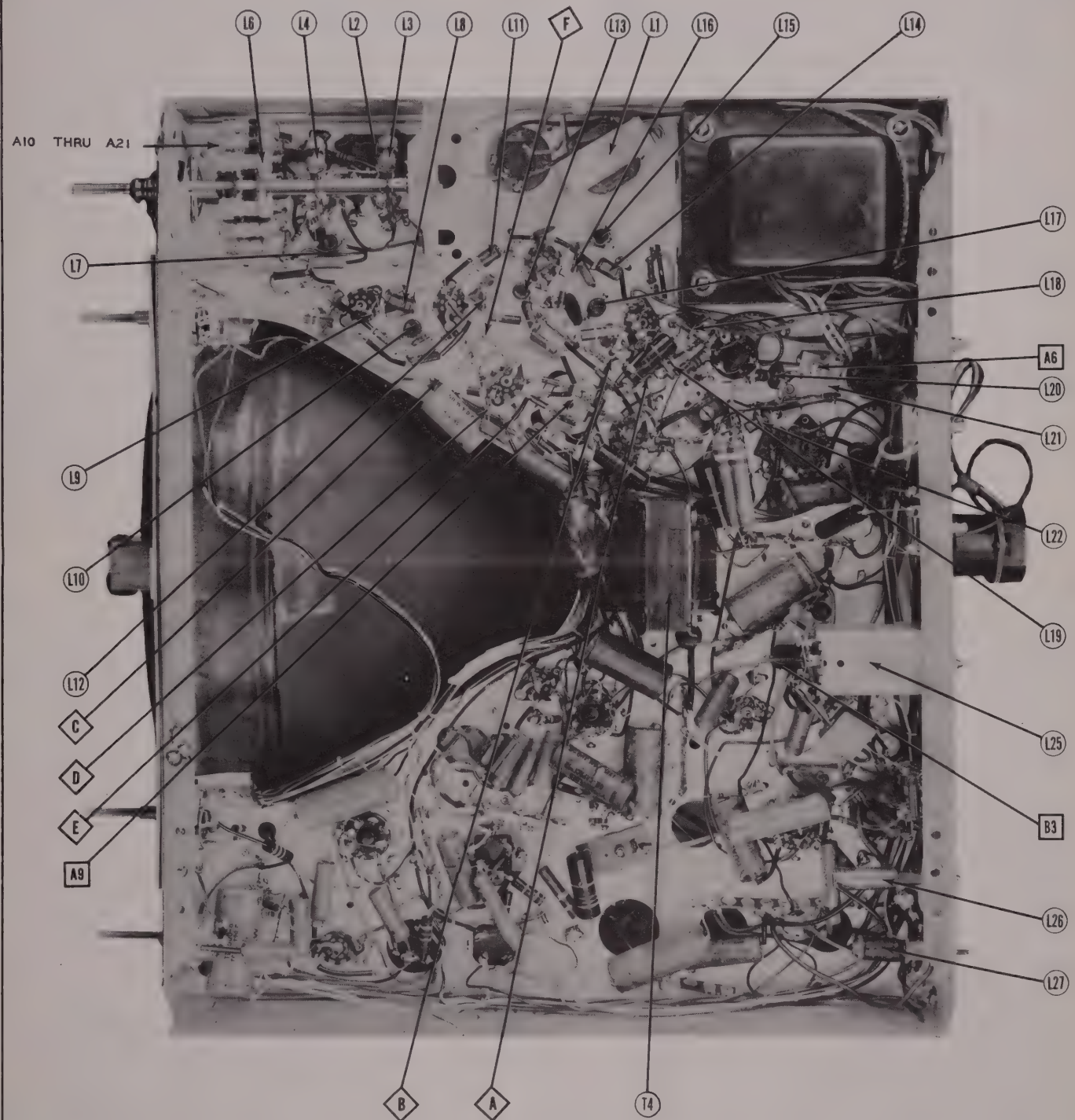
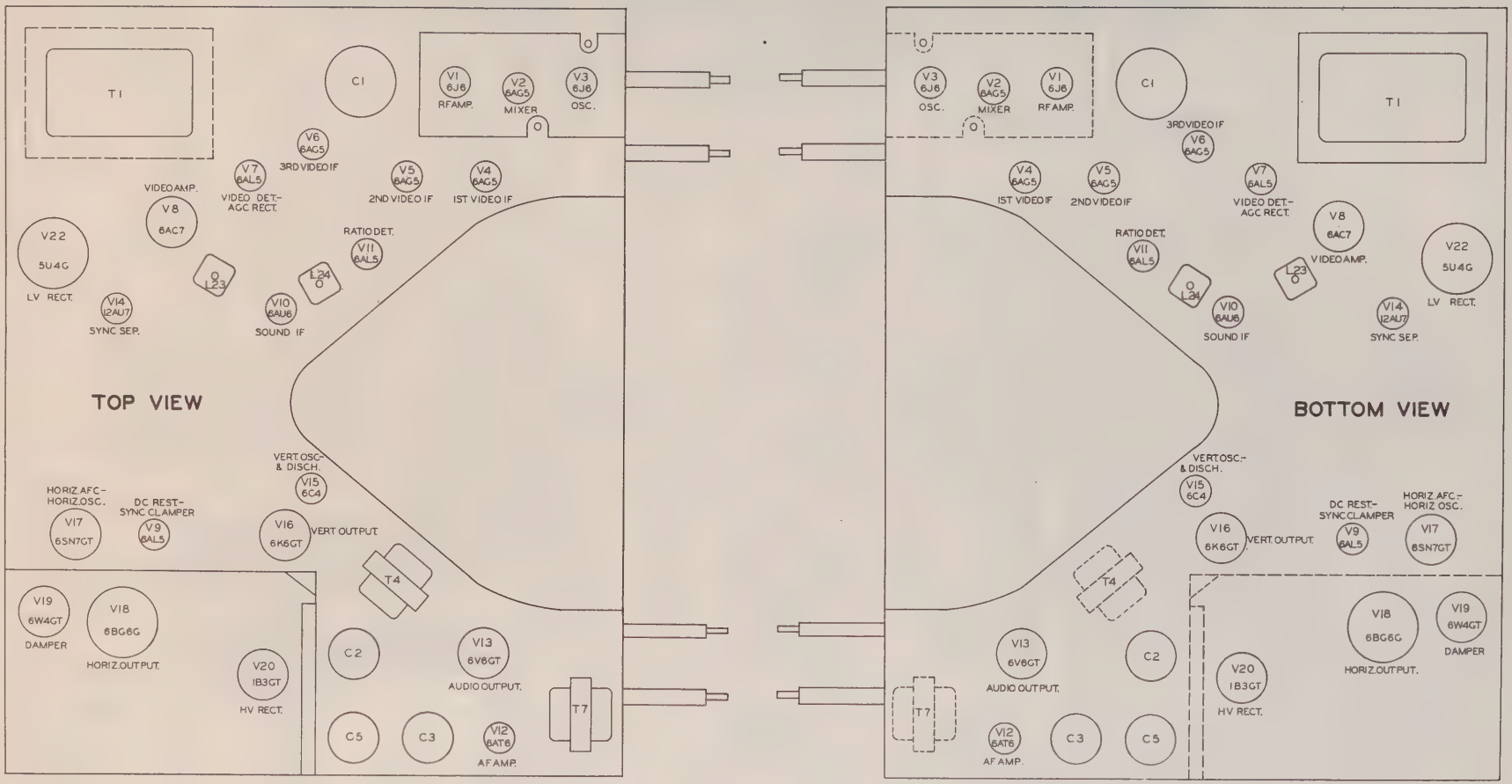


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION



TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V17) from its socket.

VIDEO IF ALIGNMENT

Turn the contrast control to the mid-position of its range.
During video IF alignment the common lead of the VTVM is connected to -2.5 volts with respect to chassis, avoid grounding the VTVM case.
Remove the local oscillator tube (V3) to prevent erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	34.45MC (Unmod.)	Any	DC Probe to Point (A) Common to Point (B)	A1, A2	Adjust for maximum deflection. Attenuate signal generator to maintain 1.5 volt reading.
2.	Direct	"	36.8MC	"	"	A3, A4	"
3.	Direct	"	32.8MC	"	"	A5	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Direct	High side to ungrounded tube shield floating over mixer tube (V2). Low side to chassis.	35MC (10MC SWP)	32.8MC 34.45MC 36.8MC 37.3MC	Any	Vert. Amp. to Point (A). Low side to chassis.		Check for response curve similar to Fig 1 with markers as shown. If necessary slightly retouch A1 thru A4 for optimum response.

4.5MC TRAP ADJUSTMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	.01MFD	High side to pin 4 (Grid) of 6AC7 (V8). Low side to chassis.	Not used	4.5MC (400 ∿ AM Mod.)	Any	Vert. Amp. to pin 2 (Grid) of picture tube. Low side to chassis.	A6	Adjust for MINIMUM 400 ∿ indication on scope.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

During sound IF alignment the common lead of the VTVM is connected to -140 volts with respect to chassis, avoid grounding or touching the VTVM case.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
6.	.01MFD	High side to pin 4 (Grid) of 6AC7 (V8). Low side to chassis.	4.5MC (Unmod.)	Any channel not used locally	DC Probe to Point (C) Common to Point (D)	A7, A8	Adjust for maximum deflection.
7.	.01MFD	"	"	"	DC Probe to Point (E) Common to Point (F)	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	.01MFD	High side to pin 4 (Grid) of 6AC7 (V8). Low side to chassis.	4.5MC (10MC SWP)	4.5MC	Any channel not used locally	Vert. Amp. to Point (C). Low side to chassis.	A7, A8	Disconnect stabilizer capacitor C7. Adjust for maximum amplitude and symmetry as per Fig 2. Reconnect stabilizer cap. C7.
7.	.01MFD	"	"	"	"	Vert. Amp. to Point (D). Low side to chassis.	A9	Adjust A9 so 4.5MC occurs at center of crossover lines as per Fig 3. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Replace the local oscillator tube (V3).
Set the fine tuning control to the mid-position of its range.
The RF and mixer portions of this receiver are pre-set at the factory and are very stable, they should not require adjustment in the field.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to ungrounded antenna lead. Low side to chassis.	57MC (10MC SWP)	55.25MC 59.75MC	2	Vert. Amp. to Point (A). Low side to chassis.	A10	Adjust to place sound marker as shown in Fig 4. The video marker should be at 50%. If the video marker falls below 45%, or above 60%, on ALL channels, turn the channel selector to channel 6 and retouch A1 thru A4 for proper response.
			63MC (10MC SWP)	61.25MC 65.75MC	3		A11	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A12	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A13	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A14	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A15	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A16	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A17	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A18	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A19	
			207MC (10MC SWP)	205.25MC 209.75MC	12		A20	
			213MC (10MC SWP)	211.25MC 215.75MC	13		A21	

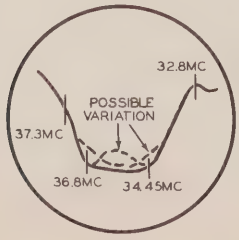


FIG.1

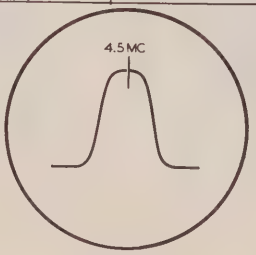


FIG. 2

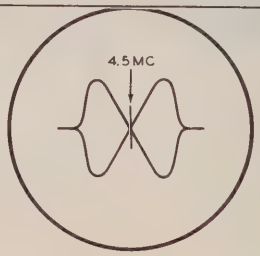
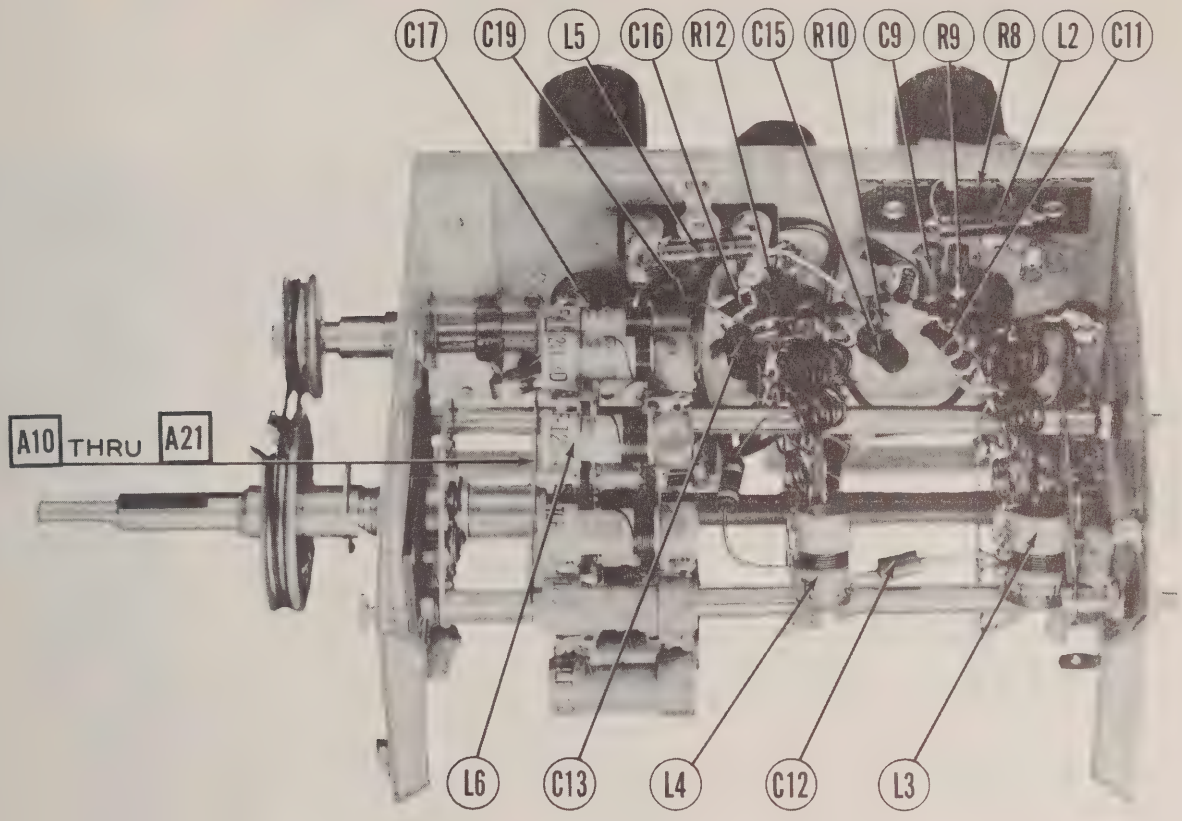
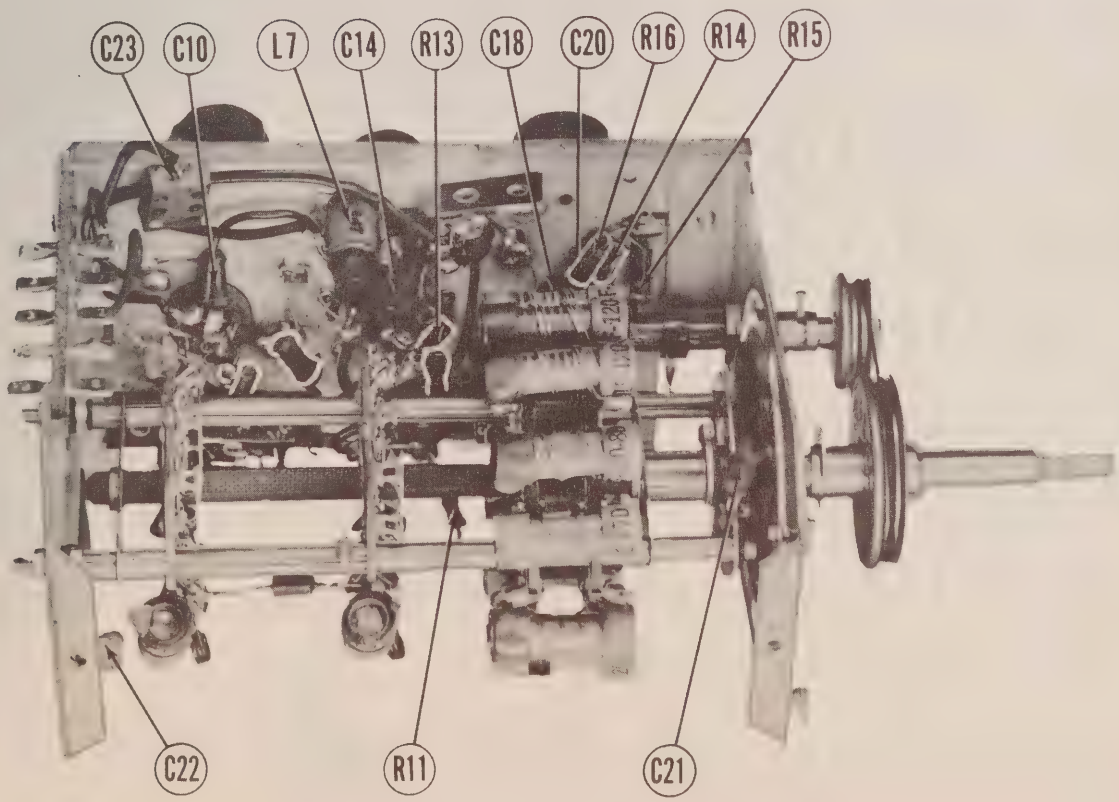


FIG. 3



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	100VDC	100VDC	6.3VAC	0V.	0V.	0V.	1VDC		
V 2	6AG5	-1.1VDC	0V.	6.3VAC	0V.	115VDC	115VDC	0V.		
V 3	6J6	95VDC	95VDC	6.3VAC	0V.	$-1.4VDC	$-2.1VDC	.2VDC		
V 4	6AG5	-.2VDC	.2VDC	6.3VAC	0V.	120VDC	120VDC	.2VDC		
V 5	6AG5	-.3VDC	.5VDC	6.3VAC	0V.	125VDC	125VDC	.5VDC		
V 6	6AG5	0V.	.9VDC	0V.	6.3VAC	122VDC	122VDC	.9VDC		
V 7	6AL5	.1VDC	-2.8VDC	6.3VAC	0V.	-2.1VDC	0V.	-.2VDC		
V 8	6AC7	0V.	0V.	1.3VDC	-2.5VDC	1.3VDC	180VDC	6.3VAC	195VDC	
V 9	6AL5	.3VDC	-1VDC	6.3VAC	0V.	0V.	0V.	0V.		
V 10	6AU6	†1.9VDC	†2.6VDC	†6.3VAC	†0V.	†245VDC	†55VDC	†2.6VDC		
V 11	6AL5	†-.1VDC	†0V.	†6.3VAC	†1.4VAC	†0V.	0V.	†-.1VDC		
V 12	6AT6	†-.6VDC	†0V.	†0V.	†6.3VAC	0V.	0V.	†100VDC		
V 13	6V6GT	0V.	†0V.	†220VDC	†240VDC	†-10VDC	†-9.3VDC	†6.3VAC	†0V.	
V 14	12AU7	95VDC	-.3VDC	0V.	0V.	0V.	232VDC	-1VDC	11VDC	6.3VAC
V 15	6C4	92VDC 330VDC	0V.	6.3VAC	0V.	92VDC 330VDC	-50VDC	0V.		
V 16	6K6GT	0V.	0V.	320VDC	320VDC	0V.	.1VDC 28VDC	6.3VAC	26VDC 42VDC	
V 17	6SN7GT	-15VDC	110VDC	.9VDC	-57VDC	170VDC	0V.	0V.	6.3VAC	
V 18	6BG6G	0V.	6.3VAC	6.7VDC	0V.	-6.6VDC	0V.	0V.	270VDC	TOP CAP *
V 19	6W4GT	0V.	0V.	460VDC	0V.	370VDC	0V.	460VDC	460VDC	
V 20	1B3GT	* DO NOT MEASURE.								
V 22	5U4G	0V.	400VDC	0V.	380VAC	0V.	380VAC	0V.	400VDC	
V 23	12LP4	0V.	.2VDC	PIN 10 370VDC	PIN 11 125VDC	PIN 12 6.3VAC				

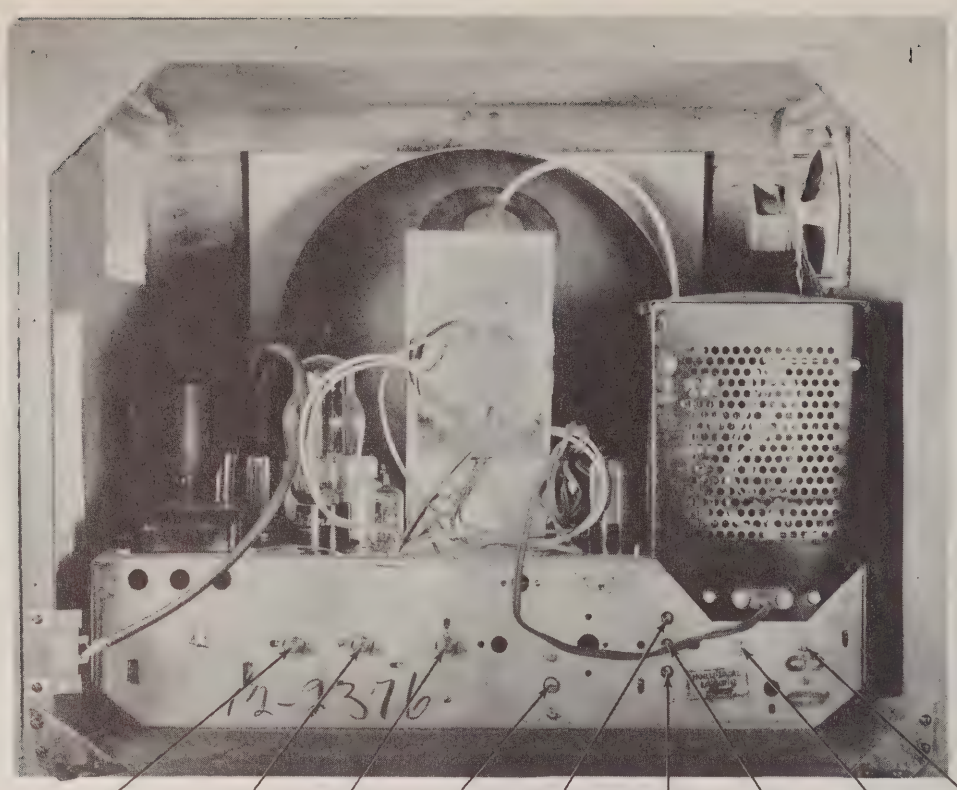
$ TAKEN WITH VACUUM TUBE VOLTMETER.
† MEASURED FROM PIN 8 OF V13.
* DO NOT MEASURE.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6J6	†1.6KΩ	†1.6KΩ	.1Ω	0Ω	0Ω	0Ω	56Ω		
V 2	6AG5	1 Meg.	0Ω	.1Ω	0Ω	†1.6KΩ	†1.6KΩ	0Ω		
V 3	6J6	†1.6KΩ	†1.6KΩ	.1Ω	0Ω	27KΩ	27KΩ	47Ω		
V 4	6AG5	700KΩ	47Ω	.1Ω	0Ω	†450Ω	†450Ω	47Ω		
V 5	6AG5	700KΩ	47Ω	.1Ω	0Ω	†300Ω	†300Ω	47Ω		
V 6	6AG5	.1Ω	100Ω	0Ω	.1Ω	†1.1KΩ	†1.1KΩ	100Ω		
V 7	6AL5	12Ω	2.2KΩ	.1Ω	0Ω	10.5KΩ	0Ω	470KΩ		
V 8	6AC7	0Ω	0Ω	700Ω	10.5KΩ	700Ω	#25KΩ	.1Ω	†5.5KΩ	
V 9	6AL5	1 Meg.	3.9 Meg.	.1Ω	0Ω	0Ω	0Ω	0Ω		
V 10	6AU6	†100KΩ	†1000Ω	†.1Ω	†0Ω	#1000Ω	#40KΩ	†1000Ω		
V 11	6AL5	Inf.	Inf.	†.1Ω	†2Ω	†0Ω	Inf.	†30KΩ		
V 12	6AT6	†470KΩ	†0Ω	†0Ω	†.1Ω	Inf.	Inf.	#390KΩ		
V 13	6V6GT	Inf.	†0Ω	#1000Ω	#250Ω	230KΩ	75KΩ	†.1Ω	†0Ω	
V 14	12AU7	#30KΩ	1 Meg.	0Ω	0Ω	0Ω	#15KΩ	3.9 Meg.	10KΩ	.1Ω
V 15	6C4	#3 Meg. #300KΩ	24Ω	.1Ω	0Ω	#3 Meg. #300KΩ	1.2 Meg.	0Ω		
V 16	6K6GT	0Ω	0Ω	#3.8KΩ	#3.8KΩ	2.2 Meg.	4KΩ 5Ω	.1Ω	5.5KΩ 1.5KΩ	
V 17	6SN7GT	780KΩ	#110KΩ	280KΩ	200KΩ	#120KΩ	0Ω	0Ω	.1Ω	
V 18	6BG6G	Inf.	.1Ω	82Ω	Inf.	1 Meg.	Inf.	0Ω	#8.5KΩ	TOP CAP #12KΩ
V 19	6W4GT	Inf.	Inf.	#12KΩ	Inf.	#250Ω	Inf.	#12KΩ	#12KΩ	
V 20	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP #12KΩ
V 22	5U4G	Inf.	20KΩ	Inf.	37Ω	Inf.	36Ω	Inf.	20KΩ	
V 23	12LP4	0Ω	1 Meg.	PIN 10 #1.2KΩ	PIN 11 75KΩ	PIN 12 .1Ω				

† MEASURED FROM PIN 8 OF V13.
# MEASURED FROM PIN 2 OF V22.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CABINET- REAR VIEW

HORIZONTAL OSCILLATOR ADJUSTMENTS

Pre-set the horizontal frequency trimmer (B1), and the horizontal locking trimmer (B2) 1 1/2 turns counter-clockwise from tight.

a) Turn the set on and tune in a TV station, preferably a test pattern. Set the contrast and brightness controls to approximately their normal setting.

b) Turn the horizontal hold control to maximum clockwise. Adjust the horizontal oscillator slug (B3) until 3 1/2 to 4 1/2 bars, sloping downward to the right, are observed on the screen.

c) Turn the horizontal hold control to maximum counter-clockwise, if the picture remains in sync, momentarily interrupt the signal by switching to another channel and back again.

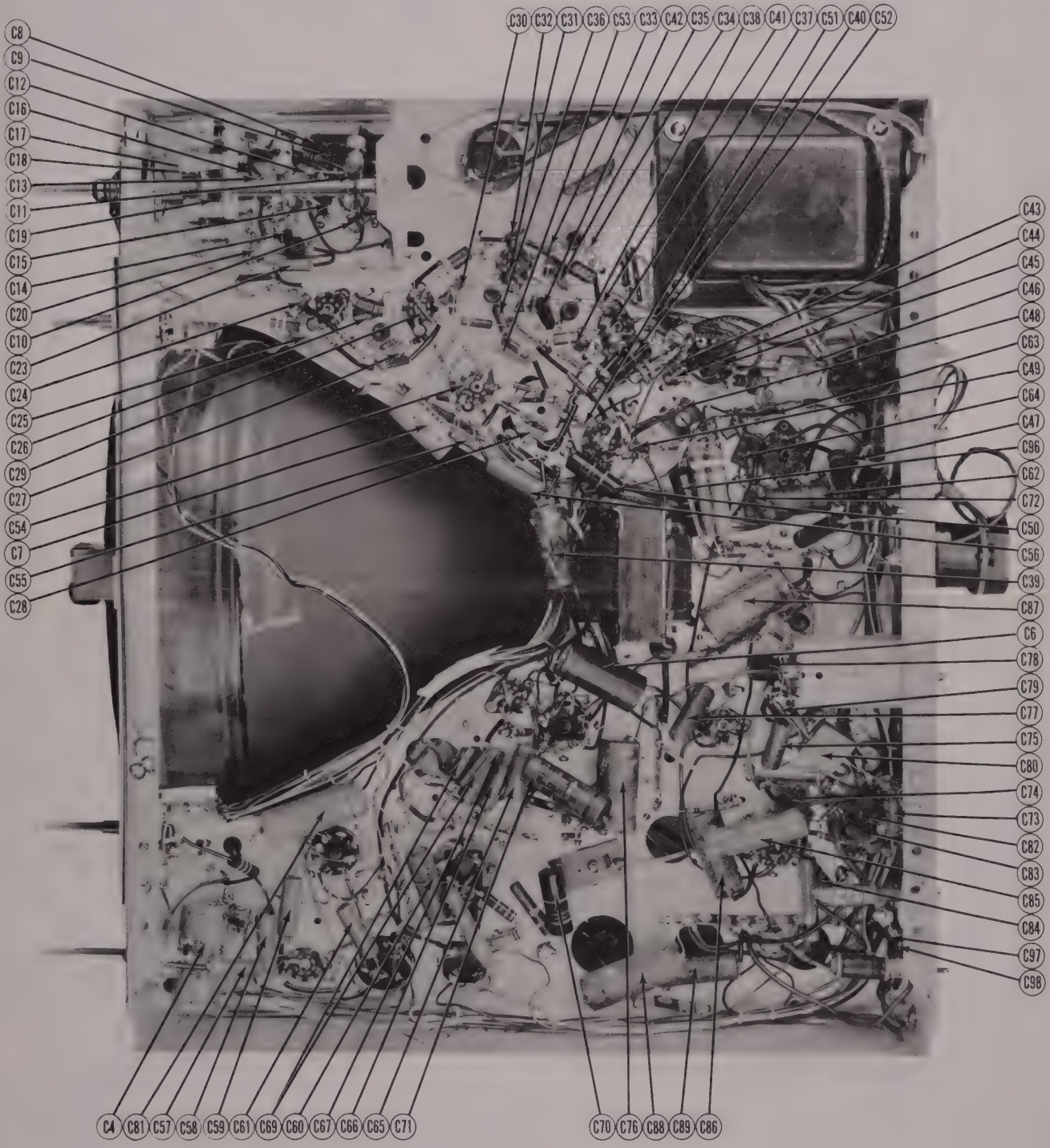
d) Slowly rotate the horizontal hold control clockwise and carefully note the number of sloping bars present just before the picture falls into synchronism. If more than 4 1/2 bars are present, turn B2 one half turn clockwise, if less than 3 1/2 bars are present, turn B2 one half turn counter-clockwise. If B2 is changed repeat steps "b" "c", and "d".

HORIZONTAL WIDTH AND LINEARITY ADJUSTMENTS

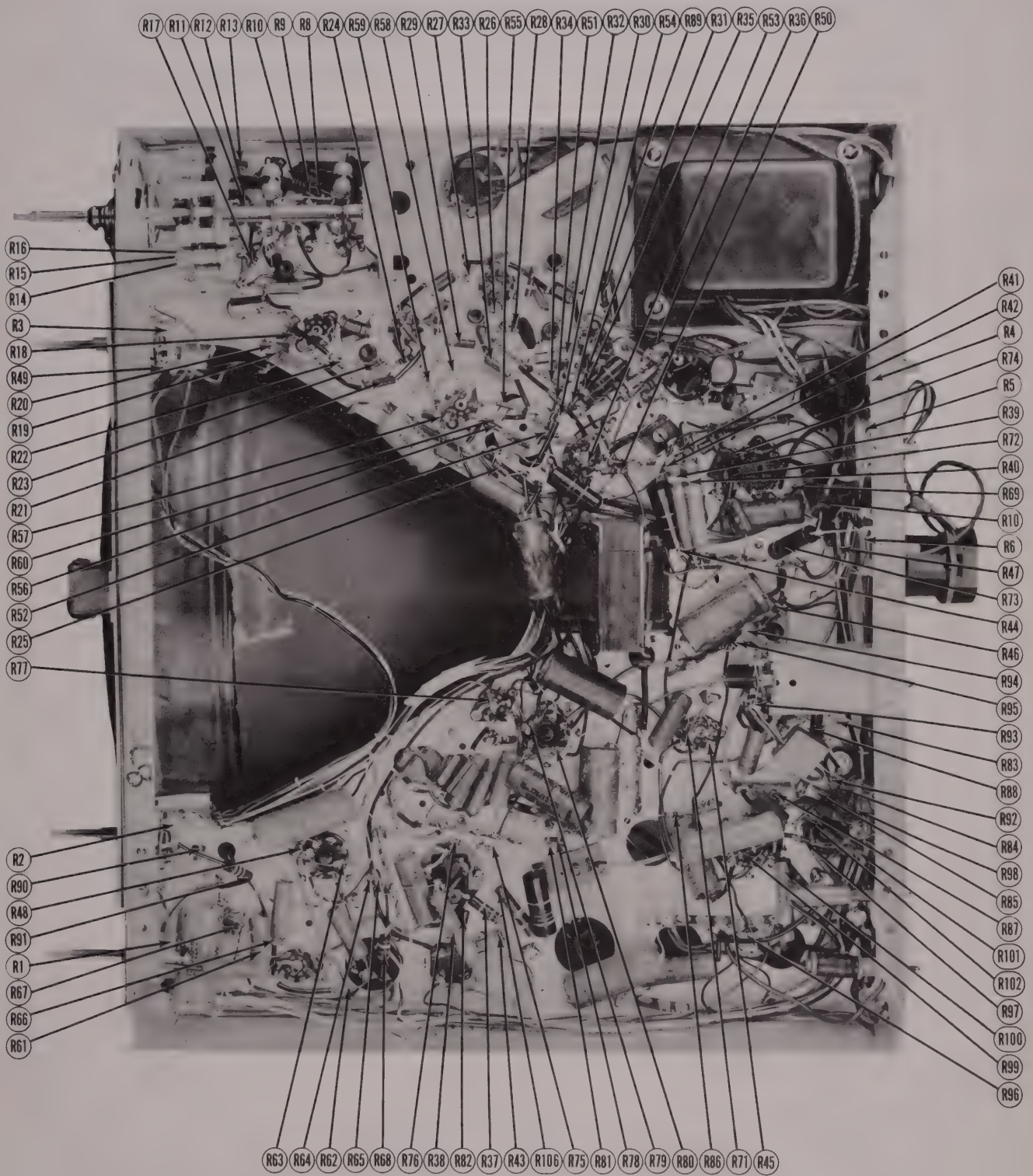
Turn the width slug (B4) all way in, (clockwise).

Adjust the horizontal drive trimmer (B5) for best compromise between brightness and horizontal linearity ; this adjustment affects primarily the overall width, and the left side of the picture.

Adjust the horizontal linearity slug (B6) for best linearity from left to right.



CHASSIS BOTTOM VIEW–CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6J6	6J6	7BF	
V2	Mixer	6AG5	6AG5	7BD	
V3	Oscillator	6J6	6J6	7BF	
V4	1st Video IF	6AG5	6AG5	7BD	
V5	2nd Video IF	6AG5	6AG5	7BD	
V6	3rd Video IF	6AG5	6AG5	7BD	
V7	Video Det.-AGC Rectifier	6AL5	6AL5	6BT	
V8	Video Amp.	6AC7	6AC7	8N	
V9	DC Restorer-Sync. Clamper	6AL5	6AL5	6BT	
V10	Sound IF	6AU6	6AU6	7BK	
V11	Ratio Det.	6AL5	6AL5	6BT	
V12	AF Amp.	6AT6	6AT6	7BT	
V13	Audio Output	6V6GT	6V6GT	7AC	
V14	Sync. Sep.	12AU7	12AU7	9A	
V15	Vert. Osc.- Vert. Disch.	6C4	6C4	6BG	
V16	Vert. Output	6K6GT	6K6GT	7S	
V17	Hor. AFC-Hor. Osc.	6SN7GT	6SN7GT	8BD	
V18	Hor. Output	6BG6G	6BG6G	5BT	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V22	LV Rectifier	5U4G	5U4G	5T	
V23A	Picture Tube	12LP4	12LP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	500	TCE-108-D	AF88K		UP4450		TVL-2830	● Filter
B	40	500							▲ Filter
C2A	40	500	TCE-126-D	AF8K10E		UP4450		TVL-2920	● Filter
B	50	200							▲ Decoupling
C3	40	300	TCE-122-D	AF8G		UP4045		TVL-1567	Decoupling
C4	500	6	TCE-129-D	PRS6/500		BRH605		TVA-1103	Bias Filter
C5A	20	450	TCE-146-D	AF-4444J		UP8DJ1112		TVL-4766	● Decoupling
B	10	450							■ Vert. Osc. Decoupling
C	10	450							▲ Vert. Output
D	10	450							V. Amp. Screen
C6	100	50	TCE-144-D	PRS50/100		BRH-501		TVA-1310	Vert. Output Cath.
C7	4	50	TCE-130-D	PRS150/4		BR550		TVA-1301	Stabilizing Cap.
C8	360		TCC-361-10	SI360	D6-391		GP2K-360	19C14	RF Coupling
C9	360		TCC-361-10	SI360	D6-391		GP2K-360	19C14	RF Cathode
C10	360		TCC-361-10	SI360	D6-391		GP2K-360	19C14	RF Filament
C11	360		TCC-361-10	SI360	D6-391		GP2K-360	19C14	RF Plate Dec.
C12	1		TCC-010-11		TCZ-1				RF Coupling
C13	22		TCC-22-12	SI22	D6-220		GP1K-22	19C23	RF Coupling
C14	5000		TCC-502-SP	BPD-005	DD-502		811-005	29C1	Mixer Decoupling
C15	360		TCC-361-10	SI360	D6-391		GP2K-360	19C14	Mixer Filament
C16	1		TCC-010-11		TCZ-1				Osc. Coupling
C17	4.7		TCC-4.7-11	SI4.7NPO	TCZ-4.7		NPOK-4.7		Osc. Feedback
C18	4.7		TCC-4.7-11	SI4.7NPO	TCZ-4.7		NPOK-4.7		Osc. Feedback
C19	360		TCC-361-10	SI360	D6-391		GP2K-360	19C14	Osc. Filament
C20	360		TCC-361-10	SI360	D6-391		GP2K-360	19C14	Decoupling
C21	360		TCC-361-10	SI360	D6-391		GP2K-360	19C14	Switch Bypass *
C22	360		TCC-361-10	SI360	D6-391		GP2K-360	19C14	Switch Bypass *
C23	270	1000	TCM-271-13	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C24	1500		TCC-152-10	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C25	1500		TCC-152-10	SI1500	D6-152	1W5D15	GP2L-0015	29C8	1st V. IF Dec.
C26	270	500	TCM-271-13	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C27	1500		TCC-152-10	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C28	1500		TCC-152-10	SI1500	D6-152	1W5D15	GP2L-0015	29C8	AGC Filter
C29A	2000		TCC-2-1	BPD-2x002	DD-2-202	1W5D2	812-2x002	29C5	2nd V. IF Fil.
B	2000					1W5D2			2nd V. IF Dec.
C30	270	500	TCM-271-13	1468-00025	D6-271	5W5T25	GP2L-270	1FM-325	IF Coupling
C31A	2000		TCC-2-1	BPD-2x002	DD-2-202	1W5D2	812-2x002	29C5	3rd V. IF Cath.
B	2000					1W5D2			3rd V. IF Dec.
C32	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	811-005	29C1	3rd V. IF Fil.
C33	1.5		TCC-1.5-11	SI1.5NPO	TCZ-1.5		NPOK-1.5		IF Coupling
C34	45			SI47N750	TCN-47		N750L-47	19C9	Fixed Trimmer
C35	270	500	TCM-271-13	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	IF Coupling
C36	1500		TCC-152-10	SI1500	D6-152	1W5D15	GP2L-0015	29C8	Decoupling
C37	180		TCC-181-11	SI180	D6-181	5W5T2	GP2K-180	19C30	IF Coupling
C38	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	811-005	29C1	DAGC Decoupling
C39	.25	200	TCP-254-1	P488-25		GT2P25		2TM-P25	AGC Filter
C40	5		TCC-050-11	SI5	TCZ-4.7	5W5V5	GP1K-5	MS-55	V. Diode Filter
C41	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	811-005	29C1	V. Det.-AGC Fil.
C42	10000		TCC-103-SP	BPD-01	DD-103	PTE6S1	821-01	36C1	Bias Filter
C43	680		TCC-681-10	SI680	D6-681	1W5T7	GP2K-680	19C17	V. Amp. Cath.
C44	470		TCC-471-10	SI470	D6-471	5W5T5	GP2K-470	19C15	V. Amp. Cath.
C45	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	811-005	29C1	V. Amp. Screen
C46	100			SI100N750	TCN-100		N750L-100	29C16	Fixed Trimmer
C47	.1	400	TCPM-104-4	P488-1	DF-104	PTE4P1		4TM-P1	Video Coupling
C48	2.2		TCC-2.2-11		TCZ-2.2				S. IF Coupling
C49	68		TCC-680-10	SI68	D6-680	5W5Q7	GP1K-68	19C10	S. IF Grid Filter
C50	.022	600	TCPM-203-10	P688-022	DF-203	PTE6S2		6TM-S22	S. IF Dec.
C51	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	811-005	29C1	S. IF Screen
C52	.022	600	TCPM-203-10	P688-022	DF-203	PTE6S2		6TM-S22	S. IF Dec.
C53	330	500	TCM-331-14	1468-00035	D6-331	5W5T3	GP2K-330	19C14	Diode Load Cap.
C54	5000		TCC-502-SP	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C55	1500		TCC-152-10	SI1500	D6-152	1W5D15	GP2L-0015	29C8	De-emphasis
C56	.01	600	TCP-103-10	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Audio Coupling
C57	.005	600	TCP-502-10	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C58	.002	600	TCP-202-10	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	De-emphasis

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C59	.01	600	TCP-103-10	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Audio Coupling
C60	.05	600	TCP-503-10	P688-05	DF-503	PTE6S5		6TM-S5	Bias Filter
C61	.005	600	TCP-502-10	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Output Plate
C62	.05	600	TCP-503-10	P688-05	DF-503	PTE6S5		6TM-S5	Sync. Coupling
C63	100	500	TCM-101-7	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Sync. Coupling
C64	390	500	TCM-391-7	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Sync. Amp. Cath.
C65	.002	600	TCP-202-10	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Integrator Net.
C66	.005	600	TCP-502-10	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net.
C67	.005	600	TCP-502-10	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Integrator Net.
C68	1500		TCC-152-10	SI1500	D6-152	1W5D15	GP2L-0015	1FM-215	Fixed Trimmer *
C69	4700	500	TCM-472-9	1467-005	D6-472	1D5D5	GP1M-0047	1FM-25	Vert. Osc. Grid
C70	.047	600	TCPM-503-10	P688-047		PTE6S5		6TM-S47	Vert. Discharge
C71	.1	600	TCPM-104-10	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C72	120	500	TCM-121-8	1468-00015	D6-121	5W5T15	GP2K-120	1FM-315	Hor. Sync. Coupling
C73	120	500	TCM-121-8	1468-00015	D6-121	5W5T15	GP2K-120	1FM-315	Voltage Divider
C74	5	1500	TCM-050-20	1469HV000005					Hor. Feedback
C75	.002	600	TCP-202-10	P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Hor. Sync. Coupling
C76	.25	400	TCP-254-4	P488-25		GT4P25		4TM-P25	AFC Filter
C77	.02	400	TCP-203-4	P488-02	DF-203	PTE4S2		4TM-S2	AFC Filter
C78	.047	600	TCPM-503-10	P688-047	DF-503	PTE6S5		6TM-S47	Hor. AFC Plate
C79	180	500	TCM-181-29	1468-0002	D6-181	5W5T2	GP2K-180	1FM-32	Hor. Osc. Grid
C80	2200	500	TCM-222-14		D6-222		GP2M-0022		Hor. Discharge
C81	.25	600	TCP-254-10	684-25		GT6P25		6TM-P25	Decoupling
C82	680	500	TCM-681-8	1468-00075	D6-681	1W5T7	GP2K-680	MS-37	Hor. Sweep Coupling
C83	10	1500		1469HV00001					Hor. Feedback
C84	270	500	TCM-271-13	1468-00025	D6-271	5W5T25	GP2K-270	1FM-325	Hor. Output Screen
C85	.05	1000	TCP-503-13	P1088-05		GT6S5		MB-S5	Hor. Output Screen
C86	.25	200	TCP-254-1	P488-25		GT2P25		2TM-P25	Hor. Output Cath.
C87	.25	400	TCP-254-4	P488-25		GT4P25		4TM-P25	Hor. Sweep Coupling
C88	.1	1000	TCP-104-13	1064-1		GT6P1		PX-11	Damper Filter
C89	.035	600	TCP-353-10	P688-033					Damper Filter
C93	500	15000	TCM-501-1-SP	HV20B	TV1-502				H. V. Filter
C96	.1	400	TCPM-104-4	P488-1		PTE4P1		4TM-P1	Pic. Tube Cath. Dec.
C97	.01	400	TCPM-103-4	P488-01	D6-103	PTE4S5	821-01	4TM-S1	Line Filter
C98	.01	400	TCPM-103-4	P488-01	D6-103	PTE4S5	821-01	4TM-S1	Line Filter

* Not used in all models.

CONTROLS

ITEM No.	RATING RESIST-ANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	TVC-113-D	Q13-133	M-60-Z	B-60-S	Volume control
B	Switch		Not Req.	76-1	5W-A	#	Attach to R1A per instructions
R2A	1.5 Meg.	½		Bll-138 *			Vert. hold control-panel
B	50KΩ	½	TVC-114-DA	Bll-123 *	TVC-114-DA		Horiz. hold control-rear
C	Shaft End			E187 *			Attach per instructions in "Concentrikit"
R3A	750Ω	½					Contrast control-panel, tapped Ⓐ 500Ω
B	100KΩ	½	TVC-115-D		TVC-115-D		Brightness control-rear
R4	2.5 Meg	½	TVC-110-D	Q11-239	M-84-S	B-83	Height control
R5	1500Ω	4	TVC-112-D		10-1500		Focus control-Wire Wound
R6	5000Ω	½	TVC-111-D	Q11-114	M-19-S	B-10	Vert. linearity control

Switch is attached at factory.
* Additional parts to be used with "Concentrikit".

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R8	330Ω	½	TRC-331-2		RF Cathode
R9	56Ω	½	TRC-560-2		Parasitic Supp.
R10	1000Ω 20%	½	TRC-102-1	BTS-1000	RF Plate Decoupling
R11	4700Ω 5%	½	TRC-472-3	BTS-4700-5%	Mixer Grid Coil Shunt
R12	1 Meg. 20%	½	TRC-105-1		Mixer Grid
R13	1000Ω	½	TRC-102-1	BTS-1000	Mixer Decoupling
R14	27KΩ	½	TRC-273-1	BTS-27K	Osc. Grid
R15	27KΩ	½	TRC-273-1	BTS-27K	Osc. Grid
R16	47Ω 20%	½	TRC-470-1		Osc. Cathode
R17	1000Ω 20%	½	TRC-102-1	BTS-1000	Osc. Plate Decoupling
R18	6200Ω 5%	½	TRC-622-3		1st Video IF Grid
R19	47Ω	½	TRC-470-2		1st Video IF Cathode
R20	150Ω	½	TRW-151-1	BW-½-150	Decoupling-Wire Wound
R21	150Ω 20%	½	TRW-151-1	BW-½-150	Decoupling-Wire Wound
R22	330Ω	½	TRC-331-1		AGC Network
R23	11KΩ 5%	½	TRC-113-3		2nd Video IF Coil Shunt
R24	47Ω	½	TRC-470-2		2nd Video IF Cathode
R25	2200Ω 20%	½	TRC-222-1	BTS-2200	AGC Network
R26	8200Ω 5%	½	TRC-822-3	BTS-8200-5%	3rd Video IF Coil Shunt
R27	100Ω	½	TRC-101-2		3rd Video IF Cathode
R28	1000Ω 20%	½	TRC-102-1	BTS-1000	3rd Video IF Decoupling
R29	150Ω 20%	½	TRW-151-1	BW-½-150	Decoupling-Wire Wound
R30	220KΩ	½	TRC-224-2	BTS-220K	AGC Network
R31	470KΩ 20%	½	TRC-474-1	BTS-470K	AGC Rect. Diode Load
R32	47KΩ	1	TRC-473-5	BTA-47K	Voltage Divider
R33	150Ω 20%	½	TRW-151-1	BW-½-150	Decoupling-Wire Wound
R34	2200Ω 20%	½	TRC-222-1	BTS-2200	Bias Network
R35	8200Ω 5%	½	TRC-822-3	BTS-8200-5%	Video Det. Diode Load

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA SILVERTONE PART No.	IRC PART No.	IDENTIFICATION CODES
R36	150Ω 20%	½	TRW-151-1		Parasitic Supp.
R37	68KΩ	1	TRC-683-5	BTA-68K	Video Amp. Screen
R38	33KΩ	2	TRC-333-8	BT-2-33K	Video Amp. Screen
R39	39KΩ	2	TRC-393-8	BT-2-39K	Video Amp. Plate
R40	39KΩ	2	TRC-393-8	BT-2-39K	Video Amp. Plate
R41	3900Ω	1	TRC-392-5	BTA-3900	Voltage Divider
R42	2700Ω	1	TRC-272-5	BTA-2700	Voltage Divider
R43	22KΩ	1	TRC-223-5	BTA-22K	Voltage Divider
R44	10KΩ 20%	½	TRC-103-1	BTS-10K	Isolation
R45	1 Meg. 20%	½	TRC-105-1	BTS-1 Meg.	DC Rest. Load
R46	100KΩ 20%	½	TRC-104-1	BTS-100K	Picture Tube Grid
R47	1000Ω 20%	1	TRC-102-5	BTA-1000	Acc. Anode Decoupling
R48	220KΩ	½	TRC-224-2	BTS-220K	Voltage Divider
R49	22KΩ 20%	½	TRC-223-1	BTS-22K	Voltage Divider
R50	100KΩ	½	TRC-104-3	BTS-100K	Sound IF Grid
R51	1000Ω 20%	½	TRC-102-1	BTS-1000	Sound IF Cathode
R52	100KΩ	½	TRC-104-2	BTS-100K	Sound IF Screen
R53	47KΩ	½	TRC-473-2	BTS-47K	Voltage Divider
R54	1000Ω 20%	½	TRC-102-1	BTS-1000	Sound IF Decoupling
R55	220Ω 20%	½	TRC-221-1		Balancing
R56	220Ω 20%	½	TRC-221-1		Balancing
R57	5.1Ω	½	TRC-51A-3		Ratio Det. Filament-Wire Wound
R58	15KΩ 5%	½	TRC-153-3	BTS-15K-5%	Ratio Det. Diode Load
R59	15KΩ 5%	½	TRC-153-3	BTS-15K-5%	Ratio Det. Diode Load
R60	47KΩ 20%	½	TRC-473-1	BTS-47K	De-emphasis
R61	470KΩ 20%	½	TRC-474-1	BTS-470K	AF Grid
R62	390KΩ 20%	½	TRC-394-1	BTS-390K	AF Plate
R63	100KΩ	½	TRC-104-2	BTS-100K	Output Grid
R64	180KΩ 5%	½	TRC-184-3	BTS-180K-5%	Voltage Divider
R65	330KΩ 5%	½	TRC-334-3	BTS-330K-5%	Voltage Divider
R66	4700Ω 5%	½	TRC-472-3	BTS-4700-5%	Voltage Divider
R67	470KΩ 20%	½	TRC-474-1	BTS-470K	Voltage Divider
R68	390Ω	1	TRC-391-5	BW-1-390	Filter
R69	1 Meg. 20%	½	TRC-105-1	BTS-1 Meg.	Sync. Sep. Grid
R70	15KΩ 20%	2	TRC-153-7	BT-2-15K	Sync. Sep. Plate
R71	3.9 Meg. 20%	½	TRC-395-1	BTS-3.9 Meg.	Sync. Sep. Grid
R72	10KΩ 20%	½	TRC-103-1	BTS-10K	Sync. Sep. Cathode
R73	15KΩ 20%	2	TRC-153-7	BT-2-15K	Decoupling
R74	22KΩ 20%	½	TRC-223-1	BTS-22K	Integrator
R75	8200Ω	½	TRC-822-2	BTS-8200	Integrator
R76	8200Ω	½	TRC-822-2	BTS-8200	Integrator
R77	1.2 Meg. 5%	½	TRC-125-5	BTS-1.2 Meg. 5%	Vert. Osc. Grid
R78	220KΩ	½	TRC-224-2	BTS-220K	Vert. Osc. Plate
R79	1500Ω	½	TRC-152-2	BTS-1500	Vert. Output Cathode
R80	2.2 Meg.	½	TRC-225-2	BTS-2.2 Meg.	Vert. Output Grid
R81	8200Ω	½	TRC-822-2	BTS-8200	Vert. Peaking
R82	3300Ω	1	TRC-332-5	BTA-3300	Vert. Output Decoupling
R83	560KΩ	½	TRC-564-2	BTS-560K	Horiz. AFC Grid
R84	180KΩ	½	TRC-184-2	BTS-180K	Horiz. AFC Cathode
R85	100KΩ 5%	1	TRC-104-6	BTA-100K-5%	Horiz. AFC Cathode
R86	8200Ω	½	TRC-822-2	BTS-8200	Horiz. AFC Filter Network
R87	150KΩ	½	TRC-154-2	BTS-150K	Horiz. AFC Filter Network
R88	3.3 Meg. 5%	1	TRC-335-6	BTA-3.3 Meg. 5%	Voltage Divider
R89	30KΩ	½	TRC-303-12		Voltage Divider
R90	120KΩ	½	TRC-124-2	BTS-120K	Voltage Divider
R91	270KΩ	1	TRC-274-5	BTA-270K	Voltage Divider
R92	100KΩ 1%	1	TRC-104-SP		Horiz. Osc. Grid
R93	10KΩ	½	TRC-103-2	BTS-10K	Horiz. Osc. Transformer Shunt
R94	100KΩ	1	TRC-104-5	BTA-100K	Horiz. Osc. Plate
R95	10KΩ	½	TRC-103-2	BTS-10K	Filter
R96	56KΩ 20%	½	TRC-563-1	BTS-56K	Filter
R97	68Ω 20%	½	TRC-680-1		Parasitic Supp.
R98	1 Meg.	½	TRC-105-2	BTS-1 Meg.	Horiz. Output Grid
R99	82Ω	1	TRC-820-5	BW-1-82	Horiz. Output Cathode
R100	8200Ω	2		BT-2-8200	Horiz. Output Screen
R101	270KΩ	½	TRC-274-1	BTS-270K	Feedback
R102	560KΩ	½	TRC-564-2	BTS-560K	Feedback
R103	12KΩ	20		DG-12,000	Damper Filter-Wire Wound
R104	3.3Ω	½			HV Rect. Filament-Wire Wound
R105	1 Meg. 20%	1	TRC-105-1		HV Filter
R106	15Ω	1	TRW-150-5	BW-1-15	Bias Network-Wire Wound
R107	1500Ω	2	TRC-152-8	BT-2-1500	Focus Coil Shunt-See Note 1

Note 1. Not Used In All Models.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC Ⓐ 1.7A	750VCT .170ADC	5VAC Ⓐ 3A	6.3VAC Ⓐ 1.5A	TTR-170-D		P-3068	
		SEC. 4 6.3VAC Ⓐ 1.35A	SEC. 5 12.6VCT Ⓐ 3.6A					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	92Ω	1000Ω	TTR-161-D	A-8111	A-3000	TBO-1 ①	Vert. Block Osc. Trans.
T3	490Ω	SEC. 1	TTR-186	A-8128	HVO-3	TFB-1	Hor. Output Trans.
	Tap Ⓐ 176Ω	9.5Ω Tap Ⓐ .6Ω					
		SEC. 2 0Ω					
T4	590Ω	7.2Ω	TTR-153-2D	A-8116	A-3035 ②	TSO-4	Vert. Ouput Trans.
T5A	14Ω		TTR-159-D	DY-1	MD-1		Hor. Deflection Coil
B	63Ω						Vert. Deflection Coil
T6	260Ω		TLF-545-D		MF-1		Focus Coil

① Drill one new mounting hole.
② Drill new mounting holes.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	5.5KΩ	3.3Ω	310Ω	.5Ω	TTR-165-D	A-3877	A-2930	RO-9 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA SILVERTONE PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	PM	3.3Ω	TSP-462	ST-105 Mod. P6-X	5A1	
	CONE DIA.	V. C. DIA.				
SP2	4 3/8"	9/16"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA SILVERTONE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.170A	39Ω	.8 Henry	TTR-106-ID	C-2325 ①	C-2974 ①	TR-4200 ①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SILVERTONE PART No.	MEISSNER PART No.	NOTES
L2	RF Choke	.1Ω				Part of tuner.
L3	RF End Inductor	0Ω				Part of tuner.
L4	RF End Inductor	0Ω				Part of tuner.
L5	RF Choke	.1Ω				Part of tuner. Not used in all models.
L6A	Osc. Coil	0Ω		TLF-120-1D		Channel #2
B	Osc. Coil	0Ω		TLF-120-2D		Channel #3
C	Osc. Coil	0Ω		TLF-120-3D		Channel #4
D	Osc. Coil	0Ω		TLF-120-4D		Channel #5
E	Osc. Coil	0Ω		TLF-120-5D		Channel #6
F	Osc. Coil	0Ω		TLF-120-6D		Channel #7
G	Osc. Coil	0Ω		TLF-120-7D		Channel #8
H	Osc. Coil	0Ω		TLF-120-8D		Channel #9
I	Osc. Coil	0Ω		TLF-120-9D		Channel #10
J	Osc. Coil	0Ω		TLF-120-10D		Channel #11
K	Osc. Coil	0Ω		TLF-120-10D		Channel #12
L	Osc. Coil	0Ω		TLF-120-10D		Channel #13
L7	1st Video IF	.1Ω		TLF-147-D		Part of tuner.
L8	Fil. Choke	0Ω		TLF-520-D		
L9	Plate Choke	1.3Ω		TLF-146-D		
L10	2nd Video IF	.1Ω		TLF-147-D		
L11	Fil. Choke	0Ω		TLF-144-D		
L12	Plate Choke	1.3Ω		TLF-146-D		
L13	3rd Video IF	.1Ω		TLF-148-D		
L14	Fil. Choke	0Ω		TLF-520-D		
L15	33.8MC Trap	0Ω		TLF-157-D		

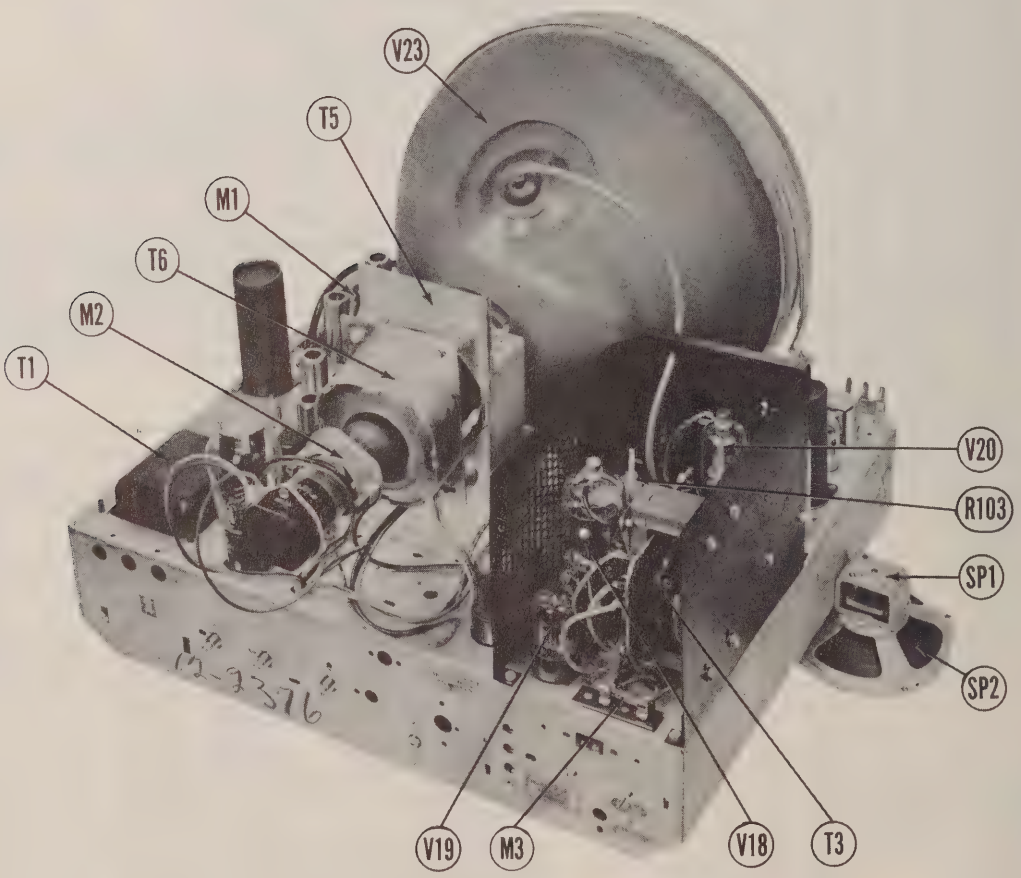
PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF) CONT.

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	
L16	Plate Choke	1.3Ω		TLF-146-D		
L17	4th Video IF	.1Ω		TLF-147-D		
L18	Peaking	7.5Ω		TLF-513-D		Inductance-120 microhenries.
L19	Peaking	20Ω		TLF-514-D		Inductance-600 microhenries.
L20	Peaking	11Ω		TLF-526-D		210 microhenries. Wound on 18KΩ resistor.
L21	4.5 MC Trap	1Ω		TLF-525-D		Inductance-300 microhenries.
L22	Peaking	15Ω		TLF-527-D		
L23	Sound IF	1.8Ω		TLF-114-D		
L24	Ratio Det. Transformer	4Ω	2Ω	TLF-531-D		
L25	Hor. Osc. Transformer	120Ω		TTR-157		
L26	Width Cont.	.3Ω		TLF-505		
L27	Horiz. Linearity	26Ω		TLF-506		

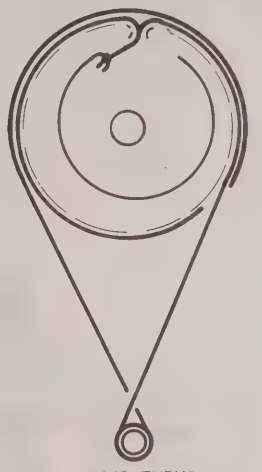
MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	RF Tuner		
M2	Ion Trap	TLF-546	
M3	Fuse	TFU-2	Type AGC, .25A
B2,B1,B5	Trimmer Assy	TAS-501-D	Horiz. Locking Range (10-160MMF), Horiz. Freq. (40-370MMF), Horiz. Drive (40-370 MMF)
	Cabinet	TCB-270	
	Safety Glass	TGL-115-D	
	Back	TBK-172-D	
	Knob	TKN-121-D	Dual
	Knob	TKN-117-D	Dual Indicator



CHASSIS-TOP VIEW

FINE TUNING DRIVE CORD STRINGING



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STEWART-WARNER MODELS
9106A, B, 9108A, B, 9109A, B
9113A

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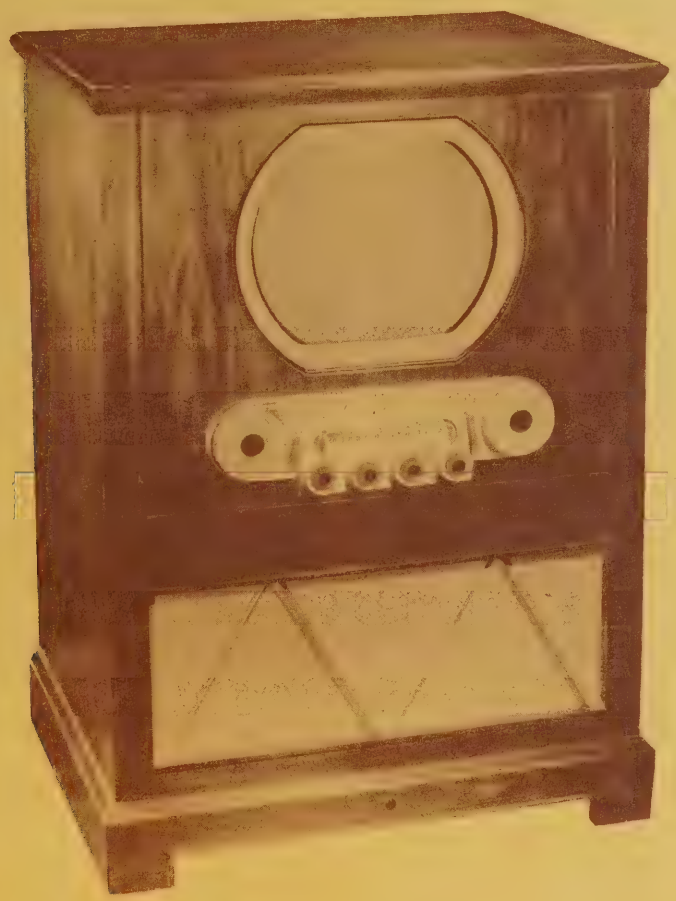

MODEL 9113A

STEWART-WARNER MODELS
9106A, B, 9108A, B, 9109A, B
9113A

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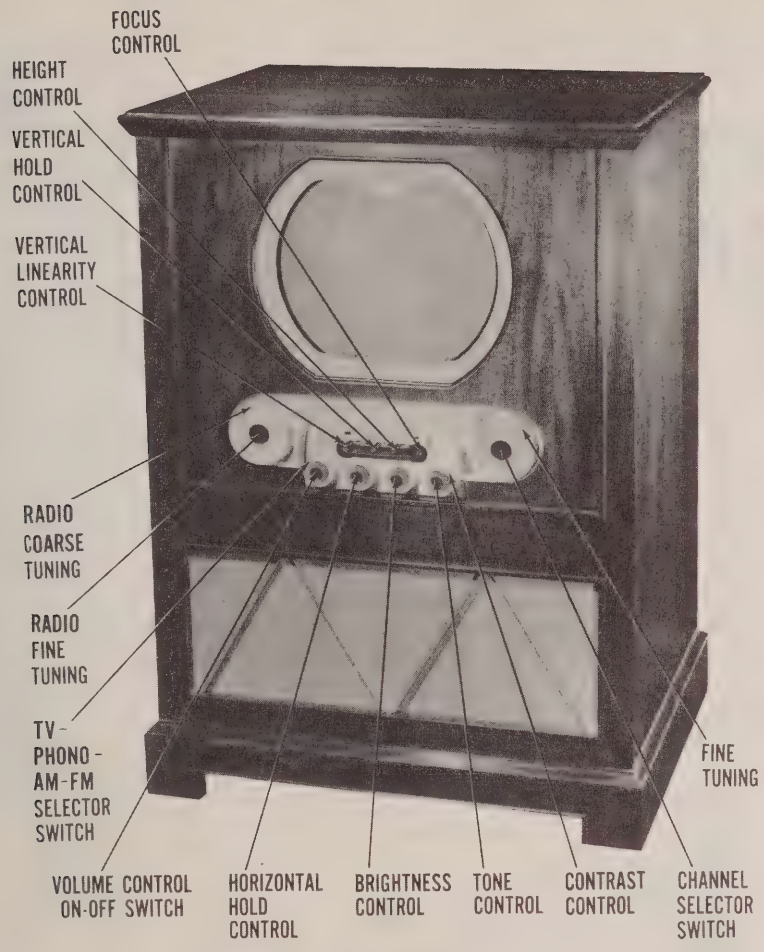
Date 12/50 Set No. 118—Folder No. 10

STEWART-WARNER MODELS 9106A, B, 9108A, B, 9109A, B, 9113A



STEWART-WARNER MODEL 9113-A

TRADE NAME	Stewart-Warner, Models 9106-A, -B, 9108-A, -B, 9109-A, -B, 9113-A
MANUFACTURER	Stewart-Warner Corp., 1826 Diversey Pkwy., Chicago, Illinois
TYPE SET	TV-AM-FM-Phono, Combination Receivers (Some models "TV Only")
TUBES	Thirty One (Models 9108A, -B, 9113-A -Combination Receivers)
	Twenty Six (Models 9106-A, -B, 9109-A, -B, - TV Only Receivers)
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	1.81 Amp. at 117 Volts AC
TUNING RANGE—	TV-Channels 2 thru 13, FM-88-108MC, AM-540-1600KC

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STEWART-WARNER MODELS 9106A, B, 9108A, B, 9109A, B, 9113A

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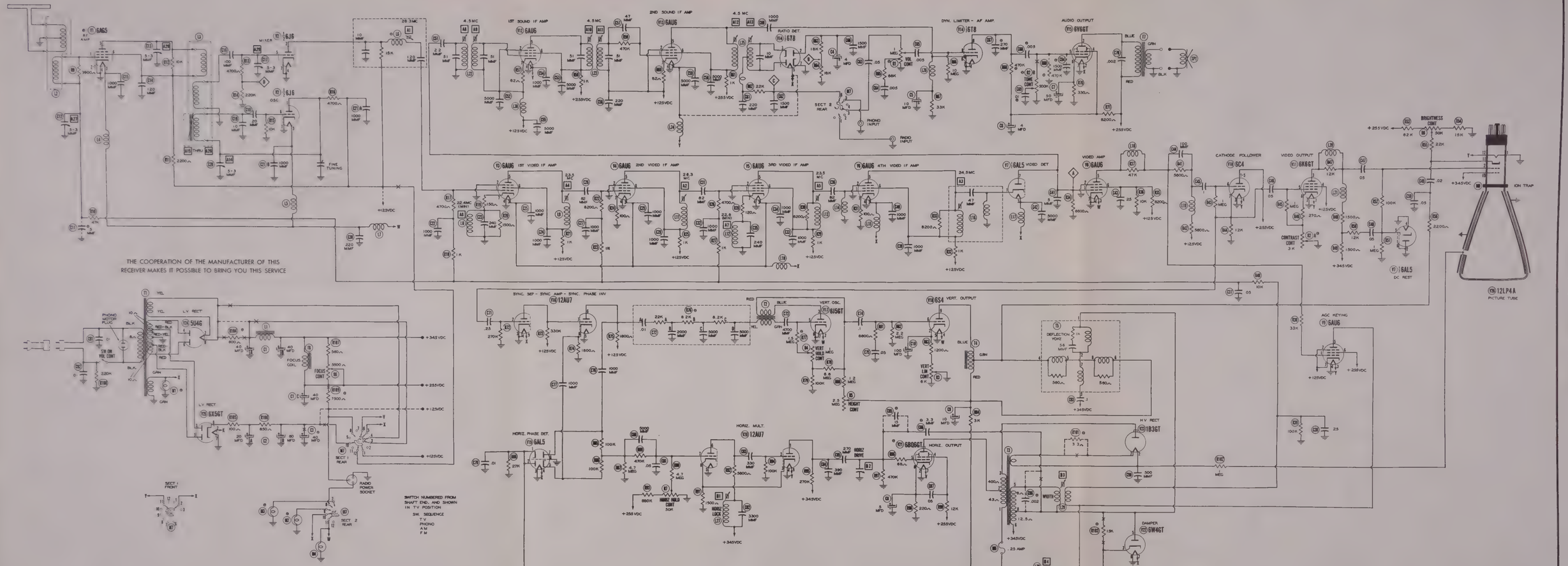
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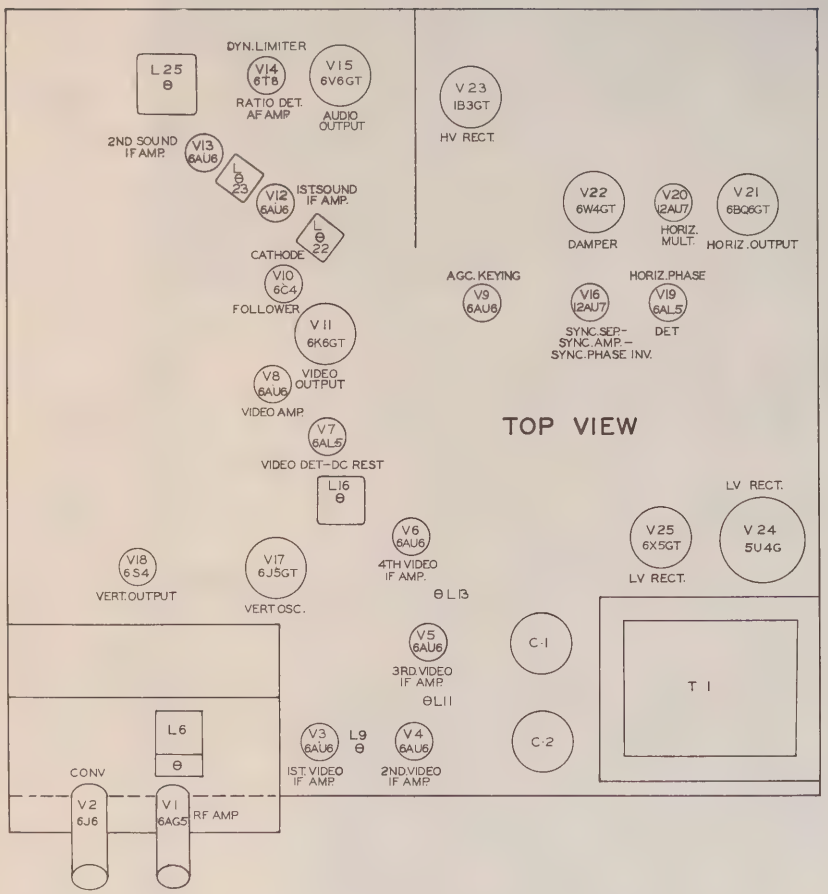
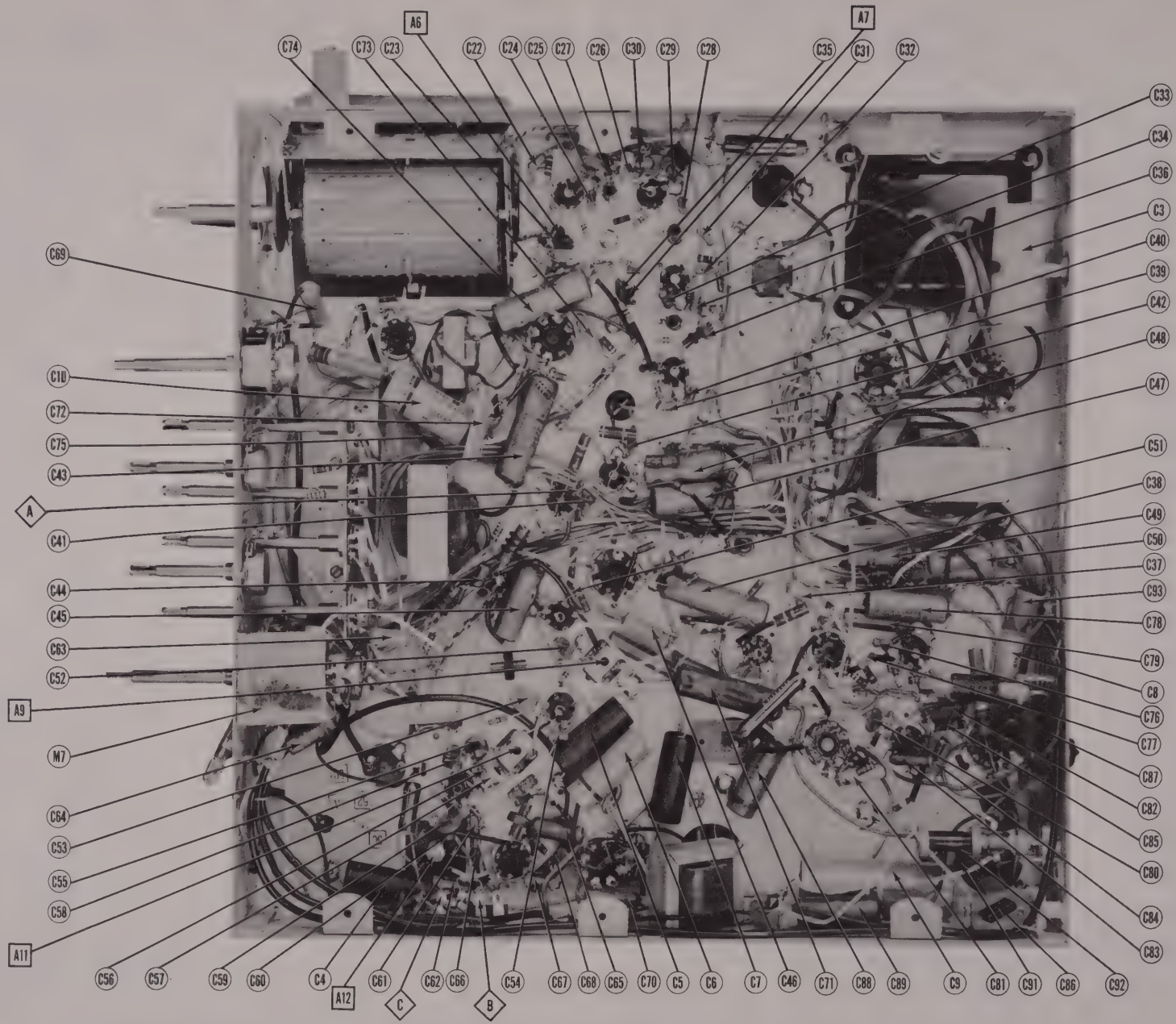
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
SWITCH NUMBERED FROM SHAFT END, AND SHOWN IN TV POSITION
SW. SEQUENCE
T V
PHONO
A M
F M
STEWART-WARNER MODELS 9106A, B, 9108A, B, 9109A, B, 9113A

STEWART-WARNER MODELS 9106A, B, 9108A, B, 9109A, B, 9113A

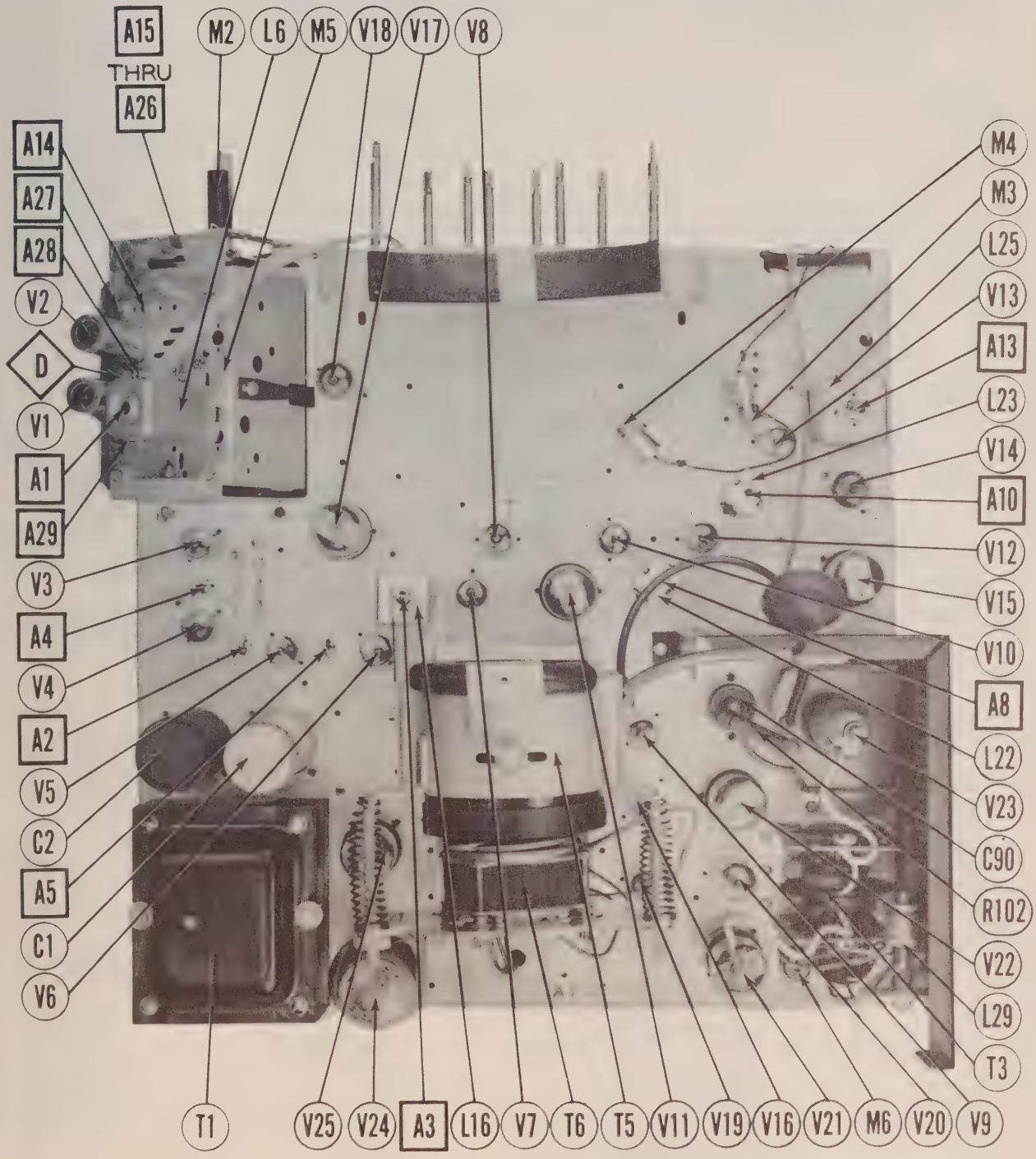


TUBE PLACEMENT CHART

STEWART-WARNER MODELS 9106A, B, 9108A, B, 9109A, B, 9113A



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION



CHASSIS-TOP VIEW

TV ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V20) from its socket.

VIDEO IF ALIGNMENT

Turn the function selector switch to "TV" (maximum clockwise).
Connect the negative lead of a 3 volt battery to the junction of R40 and C37, connect the positive lead to chassis.
Detune trap coils A6 and A7 by compressing the turns together before attempting video IF alignment. Failure to detune these traps may result in oscillations in the video IF amplifiers during alignment.
Remove the converter tube (V2) and replace it with a 6J6 which has pin 1 removed. This will disable the local oscillator and prevent the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	26.3MC (Unmod.)	Any	DC Probe to Point (A). Common to chassis.	A1, A2	Adjust for maximum deflection.
2.	Direct	"	24.5MC	"	"	A3	"
3.	Direct	"	23.5MC	"	"	A4, A5	"
4.	Direct	"	22.4MC	"	"	A6	Expand coil turns for MINIMUM deflection.
5.	Direct	"	22.8MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
Connect a 10KΩ decoupling resistor in series with the oscilloscope vertical input. Connect a .001MFD capacitor across the vertical input terminals.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	25MC (10MC SWP)	26.75MC 22.25MC	Any	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.		Check for response curve similar to figure 1. If necessary retouch A1 thru A5 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (cathode) of 6AL5 (V7). Low side to chassis.	4.5MC (Unmod.)	Any	DC Probe to Point (B). Common to chassis.	A8, A9, A10, A11, A12	Adjust for maximum deflection.
8.	.01MFD	"	"	"	DC Probe to Point (C). Common to Point (B).	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to pin 1 (Grid) of 6AU6 (V12). Low side to chassis.	4.5MC (450KC SWP)	4.5MC	Any	Vert. Amp. to Point (B). Low side to chassis.	A8, A9, A10	Disconnect stabilizer capacitor C4. Adjust for maximum amplitude and symmetry as per figure 2.
8.	.01MFD	High side to pin 1 (cathode) of 6AL5 (V7). Low side to chassis.	"	"	"	"	A11, A12	"
9.	.01MFD	"	"	"	"	Vert. Amp. to Point (C). Low side to chassis.	A13	Reconnect capacitor C4. Adjust A13 so 4.5MC occurs at center of crossover lines as per figure 3. Slightly retouch A12 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
The overall oscillator adjustment (A14) should be pre-set so that the shoulder of the screw is 3/8 inch above the chassis.
The individual channel oscillator screws are reached through a hole just to the right of the channel switch shaft.
The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point (A). Low side to chassis.	A15	Adjust to place sound marker in "notch" as shown in figure 4. The video marker should be at approximately 35%.
			213MC (10MC SWP)	211.25MC 215.75MC	13		A16	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A17	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A18	
			189MC (10MC SWP)	183.25MC 191.75 MC	9		A19	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A20	
			177MC (10MC SWP)	175.25MC 179.75MC	7		A21	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A22	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A23	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A24	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A25	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A26	

TV ALIGNMENT INSTRUCTIONS (CONT.)

RF ALIGNMENT

Connect the three volt battery as outlined under video IF alignment.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	207MC (10MC SWP)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to Point D. Low side to chassis.	A27, A28, A29	Adjust for response curve similar to figure 5 with markers at 90%.
12.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"		Check for response curve similar to figure 5. If markers fall below 70% on any channel, make slight adjustment of A27, A28 and A29 with channel switch set for that channel. Recheck all channels to see that they have not been seriously effected.
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

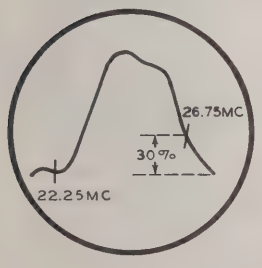


FIG.1

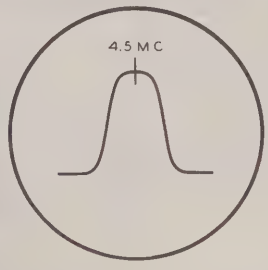


FIG. 2

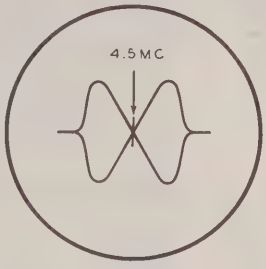


FIG. 3

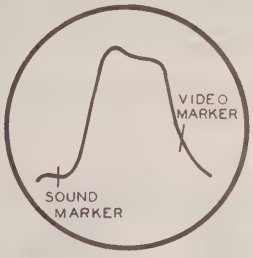


FIG.4

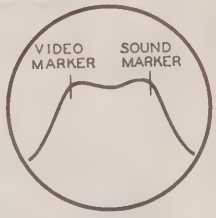


FIG.5

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

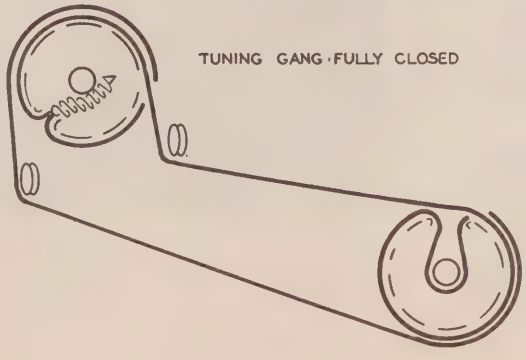
Turn the set on and tune in a TV station, preferably a test pattern.
Turn the horizontal hold control to the mid-position of its range.
Adjust the horizontal lock slug (B1) until the picture synchronizes horizontally.
Adjust the horizontal drive trimmer (B2) clockwise ajust for enough to remove any vertical lines in the picture.
Adjust the width slug (B3) wuntil the picture fills the mask horizontally.
Adjust the horizontal linearity slug (B4) until the picture is symmetrical from left to right. Readjustment of B2 may required to obtain optimum horizontal linearity.

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove ten push-on type control knobs.
2. Remove seven wood screws holding rear cover in place.
3. Disconnect built-in antenna.
4. Remove antenna terminal strip.
5. Disconnect AM Antenna.
6. Disconnect Jewel light.
7. Disconnect speaker.
8. Remove four 5/16" hex head screws for chassis. Remove chassis.
9. Remove four 5/16" hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL, REMOVE CHASSIS AS OUTLINED ABOVE.



DIAL CORD STRINGING

RADIO ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set dial turn tuning gang fully closed and set the dial to the heavy black mark at the low frequency end of dial scale. The dial may be adjusted by loosening the set screws on the tuning gang drive drum.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver f or adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
13.	.1MFD	High side to stator on front "AM" section of tuning gang. Low side to chassis.	455KC (400 ∿ Mod.)	AM (second position CW)	Tuning gang fully open	Across voice coil	A30, A31, A32, A33	Adjust for maximum output.
14.		Loop	1620KC	"	"	"	A34	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
15.		Loop	1500KC	"	Tune for max. output	"	A35	"
16.		Loop	600KC	"	"	"	A36	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 15 and 16 until no further improvement can be made.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
17.	.01MFD	High side to stator on front "FM" section of tuning gang. Low side to chassis.	10.7MC (Unmod.)	FM (maximum CCW)	Tuning gang fully open	DC Probe to Point (E). Common to chassis.	A37, A38, A39, A40, A41	Adjust for maximum deflection.
18.	.01MFD	"	"	"	"	DC Probe to Point (F). Common to Point (E).	A42	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Continue with step 20.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60 ∿ modulation and 450KC sweep. Use 120 ∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
17.	.01MFD	High side to pin 1 (Grid) of 6BA6 (V29). Low side to chassis.	10.7MC (450KC SWP)	FM (maximum CCW)	Point of non-interference	Vert. Amp. to Point (E). Low side to chassis.	A39, A40, A41	Disconnect stabilizer capacitor C97. Adjust for maximum amplitude and symmetry as per figure 6.
18.	.01MFD	High side to stator on front "FM" section of tuning gang. Low side to chassis.	"	"	"	"	A37, A38	"
19.	.01MFD	"	"	"	"	Vert. Amp. to Point (F). Low side to chassis.	A42	Reconnect capacitor C97. Adjust A42 so 10.7MC occurs at center of crossover lines as per figure 7. Slightly retouch A41 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
20.	270Ω carbon res.	High side thru 270Ω to "FM" antenna terminal. Low side to chassis.	109MC (Unmod.)	FM	Tuning gang fully open	DC Probe to Point (E). Low side to chassis.	A43	Adjust for maximum deflection.
21.	"	"	106MC	"	Tune for max. deflection.	"	A44	"

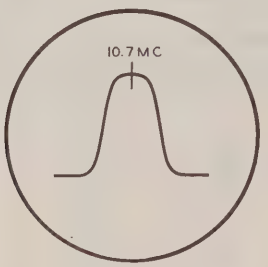


FIG. 6

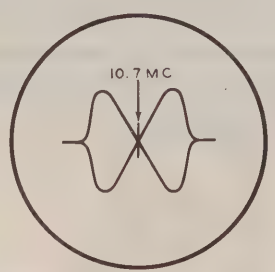


FIG. 7

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	-.3VDC	0V	6.3VAC	0V	100VDC	100VDC	0V		
V 2	6J6	95VDC	80VDC	6.3VAC	0V	-1.2VDC	§-5VDC	0V		
V 3	6AU6	-.1VDC	0V	6.3VAC	0V	115VDC	115VDC	1.3VDC		
V 4	6AU6	-.1VDC	0V	6.3VAC	0V	115VDC	115VDC	.9VDC		
V 5	6AU6	-.1VDC	0V	6.3VAC	0V	115VDC	115VDC	1.2VDC		
V 6	6AU6	0V	0V	6.3VAC	0V	115VDC	115VDC	.9VDC		
V 7	6AL5	0V	0V	6.3VAC	0V	1VDC	0V	-.4VDC		
V 8	6AU6	-.4VDC	0V	6.3VAC	0V	65VDC	60VDC	0V		
V 9	6AU6	#-60VDC	#0V	6.3VAC	0V	#-120VDC	#130VDC	#0V		
V 10	6C4	255VDC	0V	0V	6.3VAC	255VDC	18VDC	130VDC		
V 11	6K6GT	0V	0V	320VDC	125VDC	3VDC	0V	6.3VAC	42VDC	
V 12	6AU6	#0V	#0V	6.3VAC	0V	#120VDC	#120VDC	#1.1VDC		
V 13	6AU6	#0V	#0V	6.3VAC	0V	#120VDC	#120VDC	#1VDC		
V 14	6T8	-.4VDC	-1VDC	-.4VDC	0V	6.3VAC	-.5VDC	0V	-.6VDC	70VDC
V 15	6V6GT	0V	6.3VAC	230VDC	225VDC	0V	250VDC	0V	13VDC	
V 16	12AU7	22VDC	-4.2VDC	0V	0V	0V	100VDC	22VDC	20VDC	6.3VAC
V 17	6J5GT	0V	6.3VAC	140VDC	0V	-27VDC	0V	0V	0V	
V 18	6S4	0V	18VDC	0V	6.3VAC	0V	0V	0V	0V	390VDC
V 19	6AL5	0V	0V	0V	6.3VAC	7VDC	0V	-5VDC		
V 20	12AU7	110VDC	-4.8VDC	14VDC	0V	0V	310VDC	.3VDC	14VDC	6.3VAC
V 21	6BQ6GT	0V	0V	0V	155VDC	-.7VDC	-.7VDC	6.3VAC	18VDC	TOP CAP *
V 22	6W4GT	0V	0V	450VDC	0V	345VDC	0V	6.3VAC	0V	
V 23	1B3GT	* DO NOT MEASURE								
V 24	5U4G	120VDC	345VDC	0V	340VAC	0V	340VAC	0V	345VDC	
V 25	6X5GT	0V	6.3VAC	170VAC	345VDC	170VAC	0V	0V	175VDC	
V 26	12LP4A	0V	1VDC	PIN 10 345VDC	PIN 11 105VDC	PIN 12 6.3VAC				

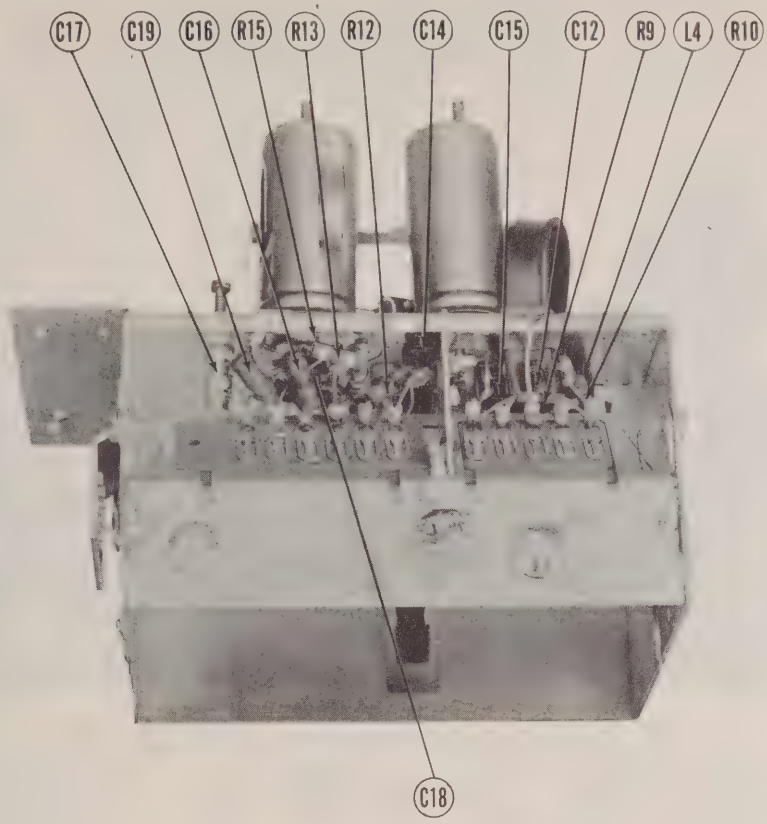
§ TAKEN WITH VACUUM TUBE VOLTMETER
# MEASURED FROM 125VDC POINT
* DO NOT MEASURE

RESISTANCE READINGS

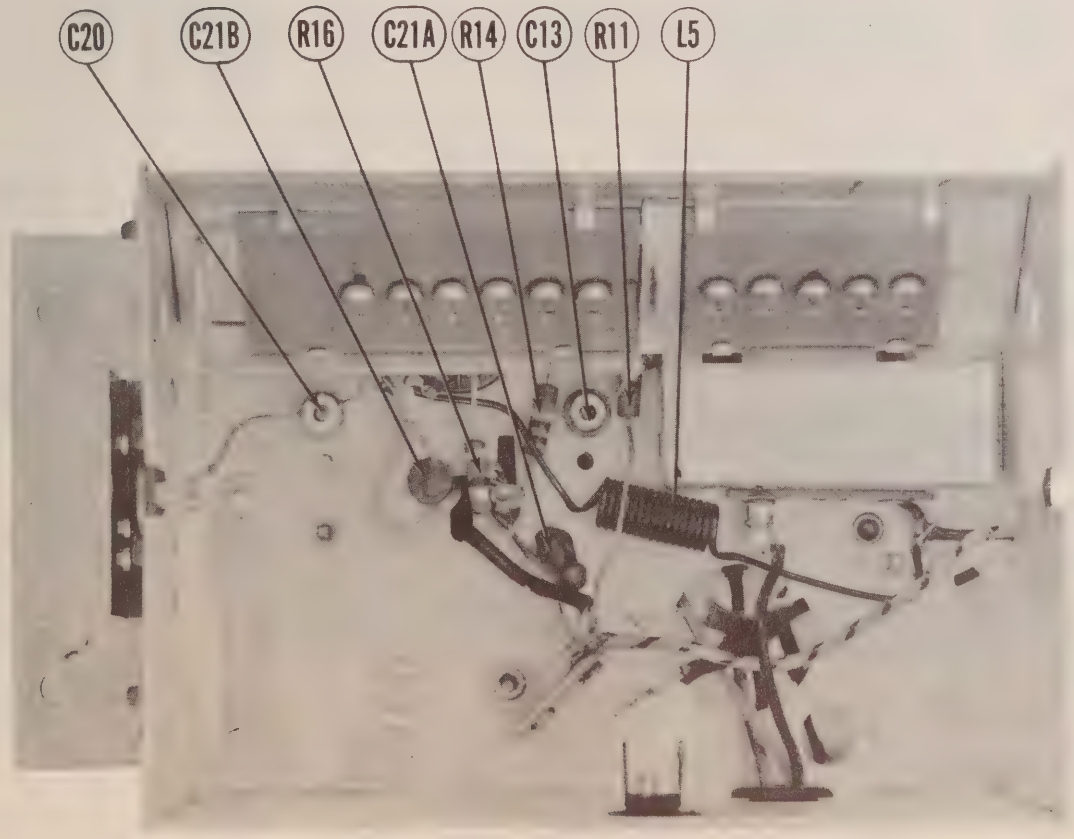
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AG5	160KΩ	0Ω	.1Ω	0Ω	†3.2KΩ	†3.2KΩ	0Ω		
V 2	6J6	†5.7KΩ	†16KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6AU6	115KΩ	0Ω	.1Ω	0Ω	†2KΩ	†2KΩ	150Ω		
V 4	6AU6	120KΩ	0Ω	.1Ω	0Ω	†2KΩ	†2KΩ	100Ω		
V 5	6AU6	115KΩ	0Ω	.1Ω	0Ω	†2KΩ	†2KΩ	120Ω		
V 6	6AU6	3Ω	0Ω	.3Ω	0Ω	†2KΩ	†2KΩ	100Ω		
V 7	6AL5	2.2Ω	0Ω	.7Ω	0Ω	1 Meg.	0Ω	6.8KΩ		
V 8	6AU6	6.8KΩ	0Ω	.1Ω	0Ω	†12KΩ	†9.2KΩ	0Ω		
V 9	6AU6	†45KΩ	†1KΩ	.1Ω	0Ω	100KΩ	▲1KΩ	†1KΩ		
V 10	6C4	▲1KΩ	Inf.	0Ω	.1Ω	▲1KΩ	1 Meg.	12KΩ		
V 11	6K6GT	Inf.	0Ω	▲3KΩ	†1KΩ	1 Meg.	Inf.	.1Ω	3.3KΩ	
V 12	6AU6	†950Ω	†950Ω	.1Ω	0Ω	▲2KΩ	▲2KΩ	†1KΩ		
V 13	6AU6	†470KΩ	†950Ω	.7Ω	0Ω	▲2KΩ	▲2KΩ	†1KΩ		
V 14	6T8	Inf.	36KΩ	Inf.	0Ω	.1Ω	33KΩ	0Ω	10 Meg.	▲480KΩ
V 15	6V6GT	Inf.	.1Ω	▲1.7KΩ	▲9.2KΩ	500KΩ	▲1KΩ	0Ω	330Ω	
V 16	12AU7	†330KΩ	270KΩ	0Ω	0Ω	0Ω	†2.8KΩ	†330KΩ	1.8KΩ	.1Ω
V 17	6J5GT	0Ω	.1Ω	▲1.2Meg.	Inf.	1.6 Meg.	Inf.	0Ω	0Ω	
V 18	6S4	Inf.	1.2KΩ	2.2 Meg.	.1Ω	0Ω	2.2 Meg.	Inf.	Inf.	▲20KΩ
V 19	6AL5	27KΩ	27KΩ	0Ω	.1Ω	2.8 Meg.	0Ω	2.8 Meg.		
V 20	12AU7	▲270KΩ	100KΩ	1.5KΩ	0Ω	0Ω	▲5.7KΩ	2.8 Meg.	1.5KΩ	.1Ω
V 21	6BQ6GT	Inf.	0Ω	Inf.	▲13KΩ	470KΩ	470KΩ	.1Ω	200Ω	▲15KΩ
V 22	6W4GT	0Ω	Inf.	▲15KΩ	Inf.	▲20Ω	Inf.	.1Ω	0Ω	
V 23	1B3GT	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP ▲15KΩ
V 24	5U4G	†1KΩ	70KΩ	Inf.	20Ω	Inf.	20Ω	Inf.	70KΩ	
V 25	6X5GT	Inf.	.1Ω	10Ω	▲0Ω	10Ω	Inf.	0Ω	18KΩ	
V 26	12LP4A	0Ω	1.1 Meg.	PIN 10 ▲10Ω	PIN 11 65KΩ	PIN 12 .1Ω				

FUNCTION SWITCH IN TV POSITION
† MEASURED FROM PIN 8 OF V25
▲ MEASURED FROM PIN 8 OF V24

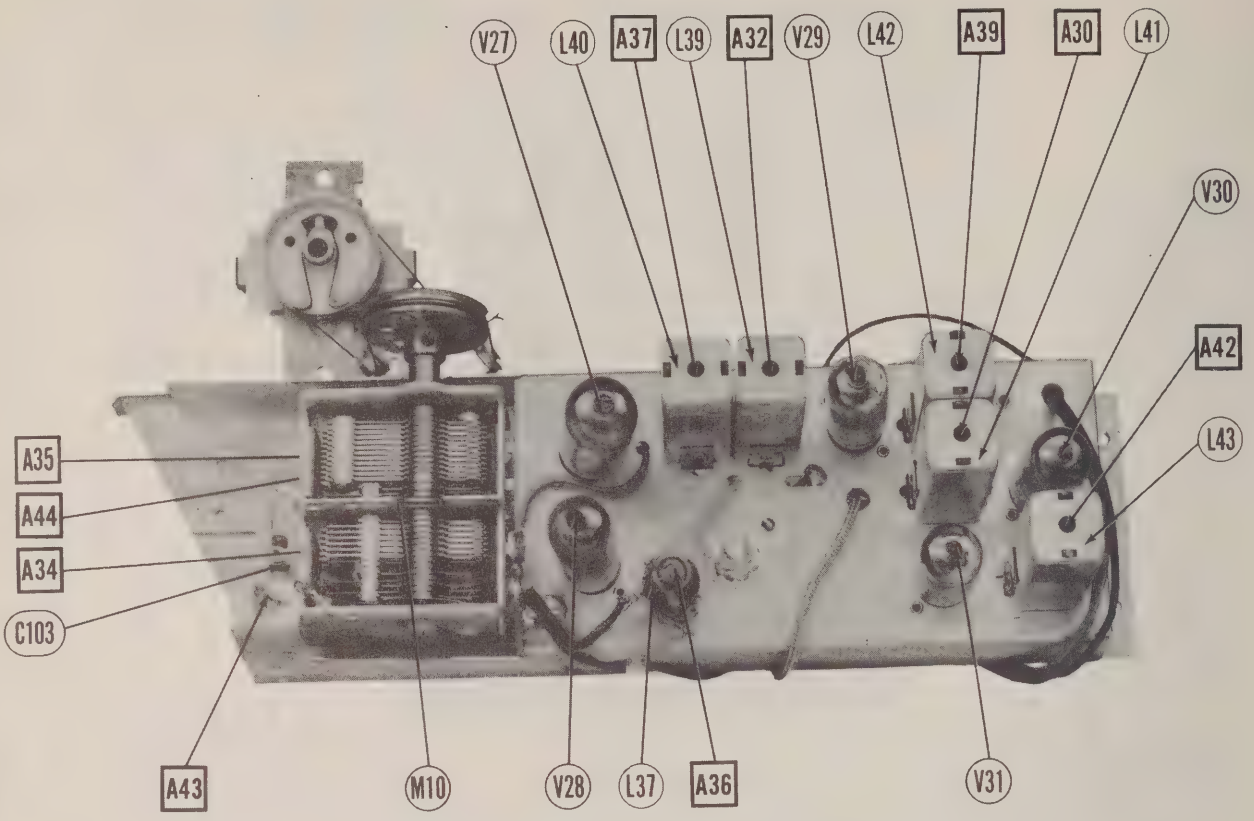
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



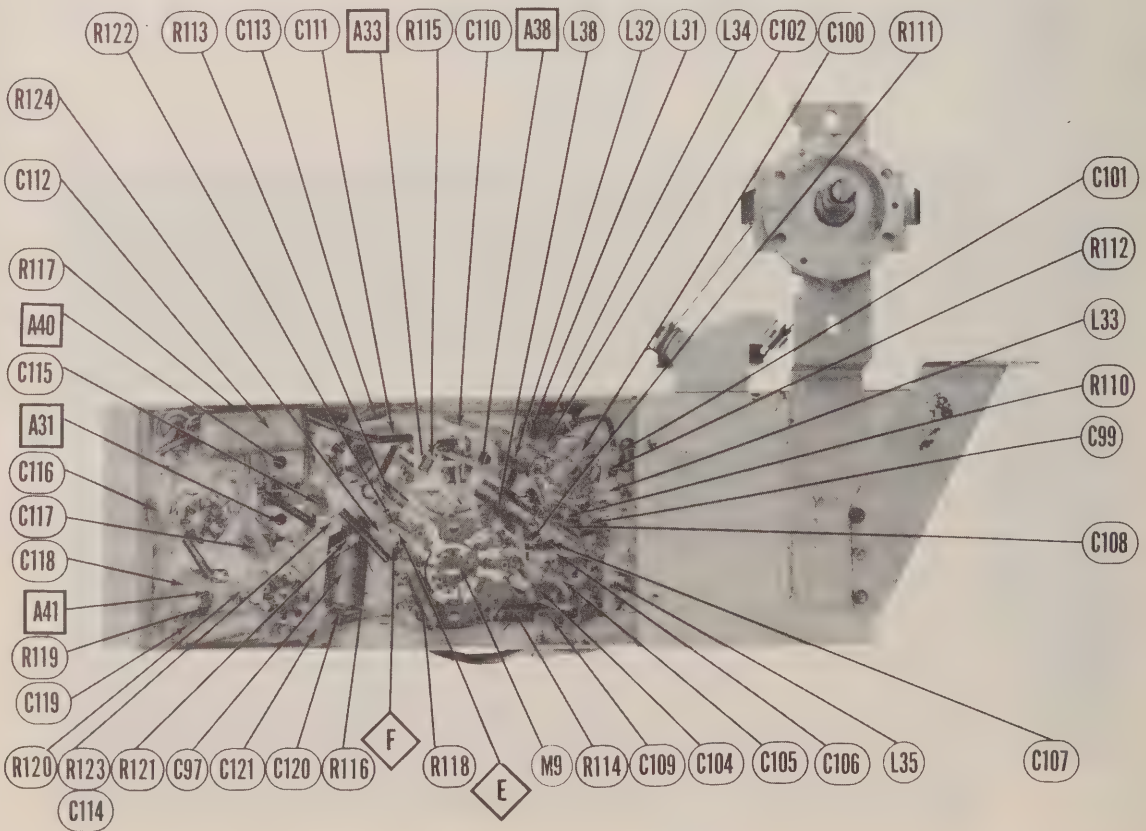
RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



RADIO CHASSIS-TOP VIEW



RADIO CHASSIS-BOTTOM VIEW

TV PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		STEW.-WARN. PART No.	STANDARD REPLACEMENT		
V1A	RF Amp.	6AG5	6AG5	7BD	
B	RF Amp.	6BC5	6BC5	7BD	
C	RF Amp.	6CB6	6CB6	7CM	
V2	Converter	6J6	6J6	7BF	
V3	1st Video IF	6AU6	6AU6	7BK	
V4	2nd Video IF	6AU6	6AU6	7BK	
V5	3rd Video IF	6AU6	6AU6	7BK	
V6	4th Video IF	6AU6	6AU6	7BK	
V7	Video Det.-DC Rest.	6AL5	6AL5	6BT	
V8	Video Amp.	6AU6	6AU6	7BK	
V9	AGC Keying	6AU6	6AU6	7BK	
V10	Cathode Follower	6C4	6C4	6BG	
V11	Video Output	6K6GT	6K6GT	7S	
V12	1st Sound IF	6AU6	6AU6	7BK	
V13	2nd Sound IF	6AU6	6AU6	7BK	
V14	Dyn. Limiter-Ratio Det.-AF Amp.	6T8	6T8	9E	
V15	Audio Output	6V6GT	6V6GT	7AC	
V16	Sync. Sep.-Sync. Amp.-Sync. Phase Inv.	12AU7	12AU7	9A	
V17	Vert. Osc.	6J5GT	6J5GT	6Q	
V18	Vert. Output	6S4	6S4	9AC	
V19	Hor. Phase Det.	6AL5	6AL5	6BT	
V20	Hor. Mult.	12AU7	12AU7	9A	
V21A	Hor. Output	6BQ6GT	6BQ6GT	6AM	
B	Hor. Output	6CD6G	6CD6G	5BT	Used in models 9109A-9109B series "A", and 9108A-9108B
V22	Damper	6W4GT	6W4GT	4CG	
V23	HV Rect.	1B3GT	1B3GT	3C	
V24	LV Rect.	5U4G	5U4G	5T	
V25	LV Rect.	6X5GT	6X5GT	6S	
V26	Picture Tube	12LP4A	12LP4A	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	STEW.-WARN. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	
C1A	40	450	508072	AFH888J		UPT44445		TVL-3787	▲ Filter
B	40	450							■ Filter
C	40	450							▲ Filter
C2A	20	300	508073	AFH1242J		UPT6245		TVL-2579	▲ Filter
B	60	300							▲ Filter
C3	40	300	160095	PRS450/40		BR4035		TVA-1611	Filter *
C4	4	150	502547	PRS150/4		BR415		TVA-1402	Stabilizing Cap.
C5	10	150	505174	PRS150/12		BR1015		TVA-1406	Dyn. Limiter Cap.
C6	4	450	504719	PRS450/4		BR445		TVA-1702	Decoupling
C7	50	25	502527	PRS25/50		BR502A		TVA-1206	Output Cath. Byp.
C8	5	50	508684	PRS150/4		BR550		TVA-1303	Hor. Output Cath.
C9	10	600	508680	PRS600/10		BRHV610		TVA-1902	Decoupling
C10	100	50	508682	PRS50/100		BRH501		TVA-1310	Vert. Output Dec.
C11	5		513432	SI5NPO	TCZ-4.7		NPOK-5		Fixed Trimmer †
C12	.5-3		507968		829-3				Variable Trimmer
C13	.5-3		507968		829-3				Variable Trimmer
C14	120		513439	SI120	D6-121		GP2K-120	19C29	RF Amp. Dec.
C15	1000		513009	SI1000	D6-102		GP2L-001	19C1	RF Amp. Fil.
C16	100		513440	SI100N750	TCN-100		N750L-100	19C11	RF Coupling
C17	.5-3		507968		829-3				Variable Trimmer
C18	20		513441	SI20NPO	TCZ-20		NPOK-20		Osc. Grid Cap.
C19	10		513442	SI10N750	TCN-10		N750K-10	19C4	Fixed Trimmer
C20	.5-3		507968		829-3				Variable Trimmer
C21A	1000		513009	BPD-2 x 001	DD-2-402		812-2 x 001	29C7	RF Bypass
B	1000		513009						Conv. Fil. Byp.
C22	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	AGC Filter
C23	240	500	512532	1469-00025	TCZ-240	5R5T25		MS-325	Fixed Trimmer
C24	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	1st V. IF Dec.
C25	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	1st V. IF Fil.
C26	82		513016	SI82	TCZ-82	5W5T1	GP1K-82	19C11	IF Coupling
C27	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	AGC Filter
C28	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	2nd V. IF Dec.
C29	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	2nd V. IF Fil.
C30	220		513018	SI220	D6-221	5W5T25	GP2K-220	19C13	Filament Bypass
C31	82		513016	SI82	TCZ-82	5W5T1	GP1K-82	19C11	IF Coupling
C32	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	AGC Filter
C33	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	3rd V. IF Dec.
C34	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	3rd V. IF Fil.
C35	240	500	512532	1469-00025	TCZ-240	5R5T25		MS-325	Fixed Trimmer
C36	82		513016	SI82	TCZ-82	5W5T1	GP1K-82	19C11	IF Coupling
C37	.05	200	512027	P288-05	DF-503	PTE4S5		2TM-S5	AGC Filter
C38	.25	200	512045	P488-25		GT2P25		2TM-P25	AGC Filter
C39	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	4th V. IF Dec.
C40	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	4th V. IF Fil.
C41	5		513432	SI5NPO	TCZ-4.7	5W5V5	GP1K-5	MS-55	V. Diode Filter
C42	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	V. Det. DC Res. Fil.
C43	.25	200	512045	P488-25		GT2P25		2TM-P25	V. Amp. Screen
C44	100		513003	SI100	D6-101	5W5T1	GP1K-100	19C11	Peaking
C45	.1	200	512033	P288-1	DF-104	PTE4P1		2TM-P1	Video Coupling
C46	.05	200	512027	P288-05	DF-503	PTE4S5		2TM-S5	Video Coupling
C47	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Video Coupling
C48	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Video Coupling
C49	.02	600	512019	P688-02	DF-203	PTE6S2		6TM-S2	Vert. Sweep Coupling
C50	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Integrator
C51	2.2		513001		TCZ-2.2				S. IF Coupling
C52	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	1st S. IF Dec.
C53	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	1st S. IF Dec,
C54	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	1st S. IF Fil.
C55	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C56	220		513018	SI220	D6-221	5W5T25	GP2K-220	19C13	RF Bypass
C57	47		513437	SI47	D6-470	5W5Q5	GP1K-47	19C25	S. IF Coupling
C58	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	2nd S. IF Dec.

TV PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (CONT.)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA STEW.-WARN. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C59	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	2nd S.IF Fil.
C60	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	S. IF Coupling
C61	220	500	512527	1468-00035	D6-221	5W5T25	GP2K-220	1FM-325	Diode Load Cap.
C62	1500		513010	SI1500	D6-152	1W5D15	GP2L-0015	29C8	De-emphasis
C63	.05	200	512027	DF-503	PTE6S			2TM-85	Audio Coupling
C64	.005	600	512007	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Tone Comp.
C65	.005	600	512007	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling
C66	1500		513010	SI1500	D6-152	1W5D15	GP2L-0015	29C8	RF Bypass
C67	270		513006	SI270	D6-271	5W5T25	GP2K-270	19C31	AF Amp. Plate #
C68	.005	600	512007	P688-005	D6-502	PTE6D5	811-005	6TM-D5	Audio Coupling #
C69	.01	600	512013	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Tone Comp. *
C70	.002	600	512003	P688-002	D6-202	PTE6D3	GP2M-002	6TM-D2	Output Plate Byp.
C71	.25	200	512045	P688-25		GT2P25		2TM-P25	Sync. Coupling
C72A	10000		508062 ¶	P688-01		PTE6S1	821-01	6TM-S1	Vert. Sync. Coupling
B	2000			P688-002	IPC-101 ¶	PTE6D2	GP2M-002	6TM-D2	Integrator Net.
C	5000			P688-005		PTE6D5	811-005	6TM-D5	Integrator Net.
D	5000			P688-005		PTE6D5	811-005	6TM-D5	Integrator Net.
C73	4700	500	513533	1467-005	D6-472	1D5D5	GP2M-0047	1FM-25	Vert. Osc. Grid
C74	.1	600	512037	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C75	.05	600	512308	P688-05		PTE6S5		6TM-S5	Vert. Discharge
C76	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	Hor. Sync. Coupling
C77	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	Hor. Sync. Coupling
C78	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Hor. Feedback
C79	.01	600	512013	P688-01	D6-103	PTE6S1	821-01	6TM-S1	Voltage Divider
C80	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	AFC Filter
C81	.05	200	512027	DF-503	PTE6S5			2TM-85	AFC Filter
C82	3300	500	512531						Fixed Trimmer
C83	330		513007	SI330	D6-331	5W5T3	GP2K-330	1FM-335	Hor. MV Feedback
C84	390	500	512535	1468-0004	D6-391	5W5T4	GP2K-390	1FM-34	Hor. Discharge
C85	270	500	512536	1468-0003	D6-271	5W5T3	GP2K-270	1FM-325	Hor. Sweep Coupling
C86	3.3	1500	512538						Hor. Feedback †
C87	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Hor. Output Screen
C88	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Damper Filter
C89	.05	600	512031	P688-05	DF-503	PTE6S5		6TM-S5	Damper Filter
C90	500	20000	513024	HV10B	TV1-502				HV Filter
C91	.01	400	512355	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Line Filter
C92	.01	400	512255	P488-01	D6-103	PTE4S1	821-01	4TM-S1	Line Filter
C93	.1	600	512037	P688-1	DF-104	PTE6P1		6TM-P1	Hor. Sweep Coupling
C94	1500		513010	SI1500	D6-152	1W5D15	GP2L-0015	29C8	Output Grid §
C95	15		513435						Hor. Feedback ♦
C96	.002	600	512003		P688-002	D6-202	PTE6D2	GP2M-002	6TM-D2	Fixed Trimmer ♦

* Used only in model 9113-A, 9108A and 9108B.
† Not used in all models.
† Models 9109A and 9109B use 15MMF in this application.
§ Used only in models 9106A, B and 9109A, B.
♦ Used only in model 9109A, B.
¶ Items C72A, C72B, C73C, C72D, R76A, R76B, and R76C are combined into one unit.
# Items C67, C68, R68 and R69 are combined into a capacitor-resistor combination in models 9106A, 9106B, 9109A and 9109B. Mfgr's part No. 505858.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Stew.-Warn. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	508182 *	Q13-137 X	AK-98	ANT-73	Volume control-tapped at 250KΩ
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	K-155	Attach to R1A per instructions
R2A	30000Ω	4	508201 †		RTV-222		Contrast control-front-Wire Wound
B	500KΩ	½					Tone control-rear
R3A	6000Ω	½	508053		AM-23-S	AN-13	Vertical linearity control
B	Shaft		Not Req.		KSS-5	†AK-16 & AK-3	Attach to R3A per instructions
R4A	1 Meg.	½	508051	Q11-137	AG-61-S	AN-31	Vertical hold control
B	Shaft		Not Req.	C3 †	KSS-5	†AK-16	Attach to R4A per instructions
R5A	2.5 Meg.	½	508052	Q11-239	AG-84-S	B-83	Height control
B	Shaft		Not Req.	C3 †	KSS-5	†AK-16	Attach to R5A per instructions
R6	5500Ω	4	508057		RTV-221		Focus control
R7A	50KΩ	½	508202 ††	Q11-123	AG-44-S	AN-31	Horiz. hold control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R7A per instructions
R8A	50KΩ	½	508202 ††	Q11-123	AG-44-S	AN-31	Brightness control
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Attach to R8A per instructions

* Models 9109A, 9109B, 9106A, and 9106B use part number 508054 in this application.
† Models 9109A, 9109B, 9106A, and 9106B use part number 508055 in this application without tone control
†† Models 9109A, 9109B, 9106A, and 9106B use part number 508056 in this application.
† Use this coupler with original shaft to obtain desired length.

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STEW.-WARN. PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED.
R9	3900Ω	½	510147	BTS-3900	Antenna Coil Shunt
R10	47KΩ 20%	½	510167	BTS-47K	AGC Network
R11	2200Ω 20%	½	510143	BTS-2200	RF Amp. Decoupling
R12	10KΩ	½	510155		RF Coil Shunt
R13	4700Ω	½	510148	BTS-4700	Mixer Grid
R14	220KΩ 20%	½	510179		Mixer Grid
R15	10KΩ	½	510155		Osc. Grid
R16	4700Ω	½	510148	BTS-4700	Osc. Plate
R17	4700Ω	½	510148	BTS-4700	1st Video IF Amp. Grid
R18	1000Ω 20%	½	510137	BTS-1000	AGC Filter Network
R19	150Ω 20%	½	510122	BTS-150	1st Video IF Amp. Cathode
R20	1500Ω 20%	½	510140	BTS-1500	1st Video IF Amp. Trap Coil Shunt
R21	1000Ω 20%	½	510137	BTS-1000	1st Video IF Amp. Decoupling
R22	820Ω	½	510153		2nd Video IF Amp. Grid
R23	1000Ω 20%	½	510137	BTS-1000	AGC Filter Network
R24	100Ω 20%	½	510119	BTS-100	2nd Video IF Amp. Cathode
R25	1000Ω 20%	½	510137	BTS-1000	2nd Video IF Amp. Decoupling
R26	4700Ω	½	510148	BTS-4700	3rd Video IF Amp. Grid
R27	1000Ω 20%	½	510137	BTS-1000	AGC Filter Network
R28	120Ω	½	510120	BTS-120	3rd Video IF Amp. Cathode
R29	1000Ω 20%	½	510137	BTS-1000	3rd Video IF Amp. Decoupling
R30	820Ω	½	510153		3rd Video IF Amp. Coil Shunt
R31	100Ω 20%	½	510119	BTS-100	4th Video IF Amp. Cathode

RESISTORS (CONT.)

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA STEW.-WARN. PART No.	IRC PART No.	IDENTIFICATION CODES
R32	1000Ω 20%	½	510137	BTS-1000	4th Video IF Amp. Decoupling
R33	8200Ω	½	510153		4th Video IF Coil Shunt
R34	6800Ω	½	510151	BTS-6800	Video Amp. Grid
R35	8200Ω	1	510253	BTA-8200	Video Amp. Screen
R36	10KΩ	1	510255	BTA-10K	Voltage Divider
R37	47KΩ	½	510166	BTS-47K	Peaking Coil Shunt
R38	33KΩ 20%	½	510164	BTS-33K	AGC Keying Grid
R39	100KΩ 20%	½	510173	BTS-100K	AGC Keying Plate Load
R40	10KΩ 20%	½	510155	BTS-10K	AGC Filter
R41	5600Ω	½	510150	BTS-5600	Peaking
R42	5600Ω	½	510150	BTS-5600	Peaking
R43	1 Meg. 20%	½	510191	BTS-1 Meg.	Cathode Follower Grid
R44	12KΩ	2	510356	BTB-12K	Cathode Follower Cathode
R45	1 Meg. 20%	½	510191	BTS-1 Meg.	Video Output Grid
R46	270Ω	½	510126	BTS-270	Video Output Cathode
R47	12KΩ 5%	½	510723	BTS-12K-5%	Peaking Coil Shunt
R48	1500Ω	2	510339	BTB-1500	Video Output Plate
R49	1500Ω	2	510339	BTB-1500	Video Output Plate
R50	12KΩ	½	510158	BTS-12K	Isolation
R51	1 Meg. 20%	½	510191	BTS-1 Meg.	DC Restorer Diode Load
R52	100KΩ 20%	½	510173	BTS-100K	Picture Tube Grid
R53	82KΩ	½	510171	BTS-82K	Voltage Divider
R54	15KΩ	½	510157	BTS-15K	Voltage Divider
R55	22KΩ	½	510161	BTS-22K	Voltage Divider
R56	2200Ω 20%	½	510143	BTS-2200	Blanking Network
R57	82Ω	½	510117	BTS-82	1st Sound IF Amp. Cathode
R58	1000Ω 20%	½	510137	BTS-1000	1st Sound IF Amp. Decoupling
R59	470KΩ 20%	½	510185	BTS-470K	2nd Sound IF Amp. Grid Leak
R60	82Ω	½	510117	BTS-82	2nd Sound IF Amp. Cathode
R61	1000Ω 20%	½	510137	BTS-1000	2nd Sound IF Amp. Decoupling
R62	22KΩ	½	510160	BTS-22K	De-emphasis
R63	18KΩ	½	510159	BTS-18K	Ratio Det. Diode Load
R64	18KΩ	½	510159	BTS-18K	Ratio Det. Diode Load
R65	68KΩ 20%	½	510170	BTS-68K	Tone Compensation
R66	10 Meg. 20%	½	510197	BTS-10 Meg.	AF Amp. Grid
R67	33KΩ	½	510163	BTS-33K	Dyn. Limiter GLoad
R68	470KΩ 20%	½	510185	BTS-470K	AF Amp. Plate-See Note 1
R69	470KΩ	½	510184	BTS-470K	Output Grid-See Note 1
R70	330Ω	1	510227	BTA-330	Output Cathode
R71	8200Ω	½	510153	BTS-8200	Decoupling
R72	270KΩ	½	510180	BTS-270K	Sync. Sep. Grid
R73	330KΩ	½	510181	BTS-330K	Sync. Sep. Plate
R74	1800Ω 5%	½	510739	BTS-1800-5%	Sync. Amp. Phase Inv. Cathode
R75	1800Ω 5%	½	510739	BTS-1800-5%	Sync. Amp. Phase Inv. Plate
R76A	22KΩ	½			Integrator -See Note 2
B	8200Ω	½	508002		Integrator -See Note 2
C	8200Ω	½			Integrator -See Note 2
R77	1.5 Meg.	½	510721	BTS-1.5 Meg.	Vert. Osc. Grid-See Note 3
R78	6.8 Meg. 20%	½	510196	BTS-6.8 Meg.	Voltage Divider
R79	100KΩ	½	510172	BTS-100K	Voltage Divider
R80	1.2 Meg.	½	510738	BTS-1.2 Meg.	Vert. Osc. Plate
R81	6800Ω	½	510151	BTS-6800	Vert. Peaking
R82	2.2 Meg.	½	510193	BTS-2.2 Meg.	Vert. Output Grid
R83	1200Ω	2	510338	BTB-1200	Vert. Output Cathode
R84	3000Ω 5%	½	510713	BTB-3000-5%	Vert. Output Plate Decoupling
R85	100KΩ	½	510172	BTS-100K	Horiz. Phase Det. Diode Load
R86	100KΩ	½	510172	BTS-100K	Horiz. Phase Det. Diode Load
R87	4.7 Meg. 20%	½	510195	BTS-4.7 Meg.	Horiz. Phase Det. Diode Load
R88	27KΩ	½	510162	BTS-27K	Feedback
R89	470KΩ 20%	½	510185	BTS-470K	Horiz. AFC Filter
R90	4.7 Meg. 20%	½	510195	BTS-4.7 Meg.	Horiz. MV Grid
R91	1500Ω	½	510139	BTS-1500	Horiz. MV Cathode
R92	5600Ω	½	510150	BTS-5600	Horiz. MV Plate
R93	680KΩ	½	510187	BTS-680K	Voltage Divider
R94	100KΩ	½	510172	BTS-100K	Horiz. MV Grid
R95	270KΩ	½	510180	BTS-270K	Horiz. MV Plate
R96	68Ω 20%	½	510116		Parasitic Suppressor
R97	470KΩ	½	510184	BTS-470K	Horiz. Output Grid
R98	220Ω	5	510716	1 3/4A-225	Horiz. Output Cathode-Wire Wound
R99	12KΩ	2	510356	BTB-12K	Horiz. Output Screen
R100	10KΩ	1	510254	BTA-10K	Horiz. Feedback Network
R101	3.3Ω	½	510725		HV Rectifier Filament -See Note 4
R102	1 Meg.	2	510391	BTB-1 Meg.	HV Filter
R103	15KΩ	10	510728	13/4A-15000	Damper Diode Load-See Note 5-Wire Wound
R104	600Ω	10	510741	13/4A-600	Filter-Wire Wound-See Note 6
R105	100Ω 20%	2	510319	BW-2-100	Filter
R106	850Ω	5	510726	1 3/4A-800	Filter-Wire Wound
R107	560Ω	2	510332	BTB-560	Focus Coil Shunt
R108	220KΩ 20%	½	510179	BTS-220K	Isolation
R109	7500Ω	5	510727	1 3/4A-7500	Voltage Divider-Wire Wound-See Note 6

Note 1. In models 9106A, 9106B, 9109A, and 9109B items R68, R69, C67 and C68 are combined into one unit under Mfgr's part No. 505858.
Note 2. Items R76A, R76B, R76C, C72A, C72B, C72C and C72D are combined into one unit.
Note 3. Some models use series resistors to obtain desired value.
Note 4. Not used in all models.
Note 5. Used only in model 9113-A
Note 6. Used only in models 9113-A, 9108A and 9108B.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA STEW.-WARN. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.
T1	117VAC @ 1.81A	700VCT .190ADC 350VCT .077ADC	5VAC @ 3.1A	6.3VAC @ 9.4A	508702	P-8160 ①	P-3067 ②	TP-409

① Drill one new mounting hole.
② Add series resistor to reduce plate voltage.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING DC RESISTANCE PRI.	RATING DC RESISTANCE SEC.	REPLACEMENT DATA STEW.-WARN. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	NOTES
T2	170Ω	95Ω	508076	A-8111①	A-3000 ①	TBO-1 ①	Vert. Osc. Trans.
T3	443Ω Tap @ 43Ω	18.5Ω Tap @ 12Ω SEC. 2 0Ω	50883		HVO-6		Hor. Output Trans.
T4	1300Ω Tap @ 12Ω		508674	A-8123	A-3037	TSO-5	Vert. Output Trans.
T5A	13Ω		508675		MD-3		Hor. Deflection Coil
B	50Ω						Vert. Deflection Coil
T6	1200Ω		508994				Focus Coil

① Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA STEW.-WARN. PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
T7	7300Ω	4.7Ω	650Ω	.7Ω	505912	A-3649 ①	A-3020 ①	RO-303 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS FIELD RES.	RATINGS V. C. IMP.	REPLACEMENT DATA STEW.-WARN. PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	PM	4.7Ω	508174	6974	69A2	
	CONE DIA.	V. C. DIA.				
SP2	9 x 6 1/8	9/16"				

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA STEWART WARNER PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	INSTALLATION NOTES
L1	.200ADC	10Ω	.5 Henries	508341	C-2325 ①	C-2996	TR-4200①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA STEW.-WARN. PART No.	MEISSNER PART No.	IRC PART No.	NOTES
L2	Ant. Coil	0Ω	0Ω	"			* See misc.
L3	RF, Mixer Grid & Osc. Coils	0Ω		"			* See misc.
L4	Fil. Choke	0Ω		507970			
L5	Fil. Choke	0Ω		507971			
L6A	1st Video IF	.8Ω		507985			Models 9113A, 9108A and B, 8106A & B
B	1st Video IF			509061			Model 9109A & B
L7	Fil. Choke	0Ω		507584			
L8	Cathode Choke Trap	0Ω		507567			
L9	2nd Video IF	.1Ω		507343			Less slug
L10	Fil. Choke	0Ω		507584			
L11	3rd Video IF	.1Ω		507343			Less slug
L12	Cathode Choke Trap	0Ω		507567			
L13	4th Video IF	.1Ω		507343			Less slug
L14	Grid Choke	3Ω		507367			
L15	Fil. Choke	.2Ω		507587		CLA-4.7	4.7 microhenries
L16	5th Video IF	.1Ω	2.2Ω	507591			Less slug
L17	Fil. Choke	.5Ω		507586		CLA-1	1 microhenry
L18	Peaking	22Ω		507374			
L19	Peaking	22Ω		507374			
L20	Peaking	4.3Ω		508069			
L21	Peaking	4.8Ω		508070			
L22	1st Sound IF	1.9Ω	1.9Ω	508061			
L23	2nd Sound IF	1.9Ω	1.9Ω	508061			
L24	Fil. Choke	.5Ω		507586		CLA-1	1 microhenry
L25	Ratio Det. Trans.	5.2Ω	.1Ω	507321			
L26	RF Choke	14Ω		507373			
L27	Horiz. Locking Coil	67Ω		508077			Less slug
L28	Horiz. Lin.	3.7Ω		162190			
L29	Width Coil	4.4Ω	34Ω	508667			Includes slug
L30	RF Choke	14Ω		507373			

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA STEW.-WARN. PART No.		NOTES
M1	Bayonet	6-8	.15	Brown	118921		Type #47. Models 9113A, 9108A & B
M2	Bayonet	6-8	.15	Brown	118921		Type #47. Models 9113A, 9108A & B
M3	Bayonet	6-8	.15	Brown	118921		Type #47. Models 9113A, 9108A & B
M4	Bayonet	6-8	.15	Brown	118921		Type #47.

TV PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	STEW.-WARN. PART No.	NOTES
M5A	RF Tuner	508080	Models 9113A, 9108A and B, 9106A and B
B	RF Tuner	508805	Models 9109A and B
M6	Fuse	508713	.25A 250V Type AGC
M7	Switch	508203	Funttion (TV-Phono-AM-FM) Models 9113A, 9108A and B
M8	Ion Trap	508603	
B2	Trimmer	508071	Horiz. drive 10-160MMF
	Safety Glass	508540	Model 9113A
	Safety Glass	508625	Model 9106A and B
	Safety Glass	508852	Model 9109A and B
	Safety Glass	508719	Model 9108A and B
	Knob	508627	Channel selector, models 9113A, 9108A and B, 9106A and B
	Knob	507916	Channel selector, model 9109A and B
	Knob	507917	Fine tuning
	Knob	508206	Brightness, Horiz. hold, models 9113A, 9108A and B
	Knob	508209	Contrast, models 9113A, 9108A and B
	Knob	508207	Volume, models 9113A, 9108A and B
	Knob	502563	Antenna
	Knob	508208	TV-Phono-AM-FM, models 9113A, 9108A and B
	Knob	508205	AM-FM Fine tuning, models 9113A, 9108A and B
	Knob	508204	AM-FM course tuning, models 9113A, 9108A and B
	Knob	507918	Any control except channel selector and fine tuning, models 9109A and B, 9106A and B.
	Knob	508205	Dummy, models 9109A and B, 9106A and B
	Antenna Coil	507952	Channel 2
	Antenna Coil	507953	Channel 3
	Antenna Coil	507954	Channel 4
	Antenna Coil	507955	Channel 5
	Antenna Coil	507956	Channel 6
	Antenna Coil	507957	Channel 7
	Antenna Coil	507958	Channel 8
	Antenna Coil	507959	Channel 9
	Antenna Coil	507960	Channel 10
	Antenna Coil	507961	Channel 11
	Antenna Coil	507962	Channel 12
	Antenna Coil	507963	Channel 13
	RF, Mixer & Osc. Coils	507972	Channel 2
	RF, Mixer & Osc. Coils	507973	Channel 3
	RF, Mixer & Osc. Coils	507974	Channel 4
	RF, Mixer & Osc. Coils	507975	Channel 5
	RF, Mixer & Osc. Coils	507976	Channel 6
	RF, Mixer & Osc. Coils	507977	Channel 7
	RF, Mixer & Osc. Coils	507978	Channel 8
	RF, Mixer & Osc. Coils	507979	Channel 9
	RF, Mixer & Osc. Coils	507980	Channel 10
	RF, Mixer & Osc. Coils	507981	Channel 11
	RF, Mixer & Osc. Coils	507982	Channel 12
	RF, Mixer & Osc. Coils	507983	Channel 13

RADIO PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STEW.-WARN. PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V27	FM RF Amp.-FM Mixer	12AT7	12AT7	9A	
V28	FM Osc.-AM Converter	6BE6	6BE6	7CH	
V29	1st FM-AM IF Amp.	6BA6	6BA6	7BK	
V30	2nd FM IF Amp.-AM Det.-AVC	6BA6	6BA6	7BK	
V31	Ratio Det.	6AL5	6AL5	6BT	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: STEW.-WARN. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C97	3	50	507946	PRS150/4		BR4I5		TVA-1303	Stabilizing Cap.
C98	10		513023	SI10	D6-100	5W5Q1	GPIK-10	19C19	Ant. Coupling
C99	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	FM RF Grid
C100	330		513007	SI330	D6-331	5W5T3	GP2K-330	19C14	RF Coupling
C101	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	RF Coupling
C102	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	FM RF-Mixer Fil.
C103	1		513000		TCZ-1				Osc. Coupling
C104	47		513002	SI47	D6-470	5W5Q5	GPIK-47	19C25	Osc. Grid Cap.
C105	47		513002	SI47	D6-470	5W5Q5	GPIK-47	19C25	Osc. Grid Cap.
C106	2.5		513436						Fixed Trimmer
C107	2.2		513001		TCZ-2.2				Osc. Feedback
C108	1000		513009	SI1000	D6-102	1W5D1	GP2L-001	19C1	Conv. Fil. Byp.
C109	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	Decoupling
C110	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	Decoupling
C111	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	AVC Filter
C112	.05	600	512028	P688-05	D6-503	PTE6S5		6TM-S5	AVC Filter
C113	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	1st IF Dec.
C114A	100		506338	SI100	D6-101	5W5T1	GPIK-100	19C11	Diode RF Filter *
B	100			SI100	D6-101	5W5T1	GPIK-100	19C11	Diode RF Filter *
C115	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	1st IF Fil.
C116	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	2nd IF Dec.
C117	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	2nd IF Fil.
C118	330		513007	SI330	D6-331	5W5T3	GP2K-330	19C14	Diode Load Cap.
C119	.001	400	512103	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	De-emphasis
C120	330		513007	SI330	D6-331	5W5T3	GP2K-330	19C14	RF Bypass
C121	5000		513013	BPD-005	DD-502	1D5D5	811-005	29C1	Ratio Det.-AVC Fil.

* Items C114A, C114B, and R123 are combined into one unit.

RADIO PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	STEW.-WARN. PART No.	IRC PART No.	
R110	100KΩ	½	510173		RF Amp. Grid
R111	10KΩ	½	510155		Osc. Grid
R112	2.2 Meg.	½	510193		Mixer Grid
R113	2.2 Meg.	½	510193	BTS-2.2 Meg.	AVC Filter
R114	4700Ω	1	510249	BTA-4700	Decoupling
R115	6800Ω	½	510152	BTS-6800	Decoupling
R116	3300Ω	½	510146	BTA-3300	1st IF Amp. Decoupling
R117	3300Ω	1	510246	BTA-3300	Voltage Divider
R118	1500Ω	1	510240	BTA-1500	2nd IF Amp. Decoupling
R119	220Ω	½	510125	BTS-220	Balancing
R120	18KΩ	½	510159	BTS-18K	De-emphasis
R121	10KΩ	½	510155	BTS-10K	Ratio Det. Diode Load
R122	10KΩ	½	510155	BTS-10K	Ratio Det. Diode Load
R123	47KΩ	½	*	BTS-47K	Diode Filter
R124	470KΩ	½	510185	BTS-470K	AVC Network

* R123, C114A and C114B are combined into one unit obtainable under mfgr's part No. 506338.

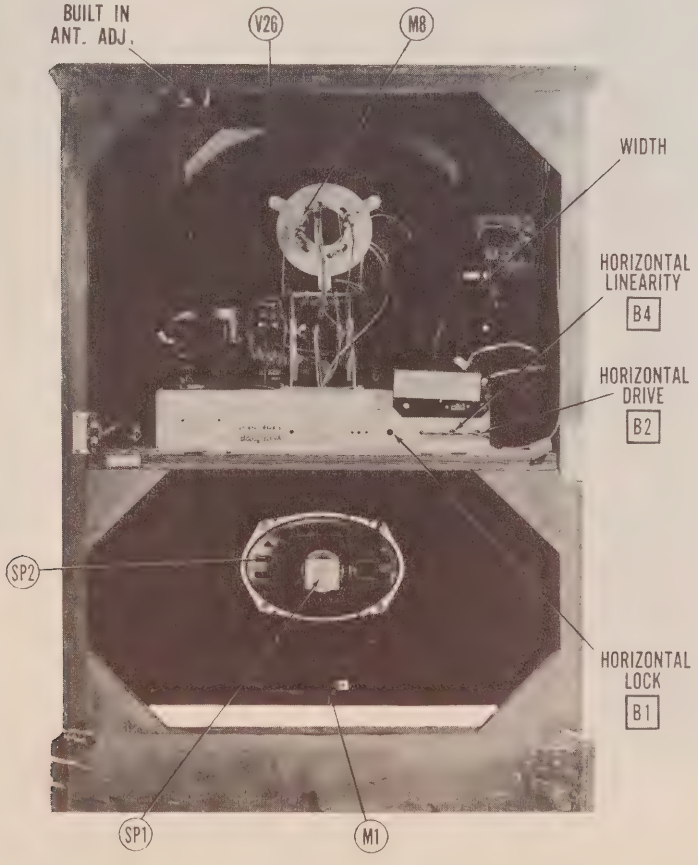
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	STEW.-WARN. PART No.	MEISSNER PART No.	IRC PART No.	
L31	FM Ant. Coil	.5Ω		507586		CLA-1	1 microhenry
L32	RF Choke	2.7Ω		507935		CLA-3.3	3.3 microhenries
L33	FM RF Coil	0Ω		507941			
L34	Para. Supp.	0Ω		506581			Wound on 1KΩ resistor
L35	FM Osc. Coil	0Ω		507942			
L36	Loop Ant.	.9Ω		508212			
L37	AM Ant. Coil	.3Ω	2.3Ω	508184			
L38	AM Osc. Coil	7.7Ω		508195	14-1074		Tap at .9Ω
L39	1st AM IF	20Ω	20Ω	505867	16-6758		
L40	1st FM IF	.5Ω	.5Ω	506080	16-3487		
L41	2nd AM IF	20Ω	20Ω	505867	16-6758		
L42	2nd FM IF	1.5Ω	.5Ω	505905	16-3487		
L43	Ratio Det. Trans.	.9Ω	1.7Ω	508179			

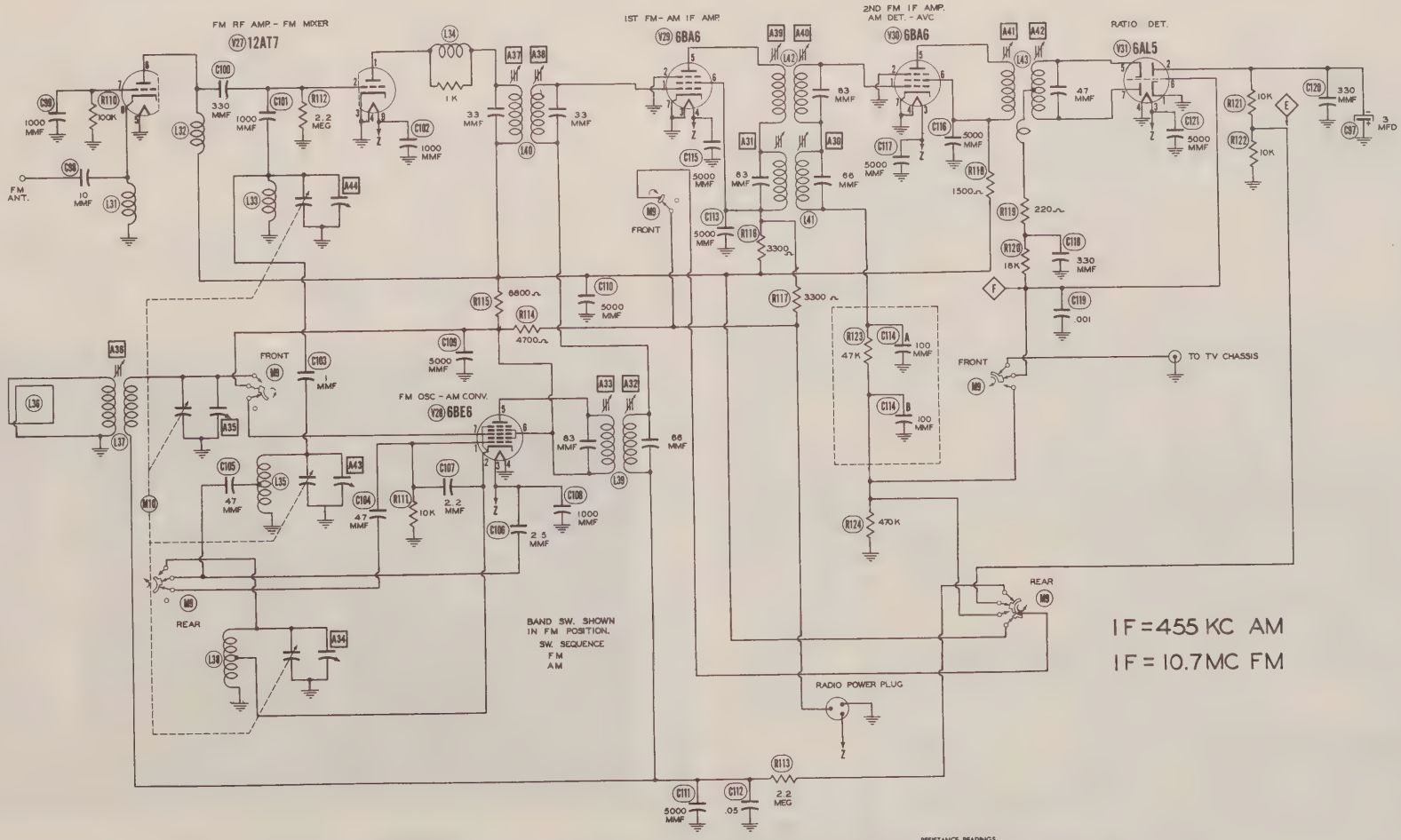
Note. Parts L31 to L43 are used in models 9113A, 9108A and B.

MISCELLANEOUS

ITEM No.	PART NAME	STEW.-WARN. PART No.	NOTES
M9	Switch	508753	AM-FM, models 9113A, 9108A and B
M10	Tuning Cap.	508729	Models 9113A, 9108A and B (26 - 560MMF, 29 - 212MMF)



CABINET-REAR VIEW



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V27	12AT7	‡140VDC	‡-.8VDC	0V	0V	0V	‡140VDC	‡-.6VDC	0V	6.3VAC
V28	6BE6	‡‡-3.1VDC ‡+-5.7VDC	0V	6.3VAC	0V	100VDC	100VDC	‡100VDC +-3.8VDC		
V29	6BA6	-.8VDC	0V	0V	6.3VAC	‡115VDC +105VDC	‡115VDC +105VDC	0V		
V30	6BA6	-.8VDC	0V	6.3VAC	0V	‡110VDC +65VDC	‡110VDC +65VDC	0V		
V31	6AL5	0V	‡-.5VDC	6.3VAC	0V	‡-.4VDC	‡-.3VDC	‡-.4VDC		

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V27	12AT7	††1KΩ	2.2 Meg.	0Ω	0Ω	0Ω +†4KΩ	††1KΩ ‡†4.5KΩ	100KΩ ‡†4KΩ	.5Ω	.1Ω
V28	6BE6	10KΩ ‡‡2.2Meg.	.9Ω	.1Ω	0Ω	‡†4.5KΩ ‡†3.7KΩ	*†4KΩ ‡†2.7KΩ	⌀2.7Meg.		
V29	6BA6	⌀2.7Meg.	0Ω	0Ω	.1Ω	*†3.7KΩ	*†3.7KΩ	0Ω		
V30	6BA6	520KΩ	5Ω	.1Ω	0Ω	‡†2.5KΩ *†7KΩ	‡†2.5KΩ *†7KΩ	0Ω		
V31	6AL5	0Ω	20KΩ	.1Ω	0Ω	Inf.	Inf.	Inf.		

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

‡ TAKEN WITH VACUUM TUBE VOLTMETER

† TAKEN IN FM POSITION
* SWITCH IN AM POSITION

† MEASURED FROM PIN 8 OF V25

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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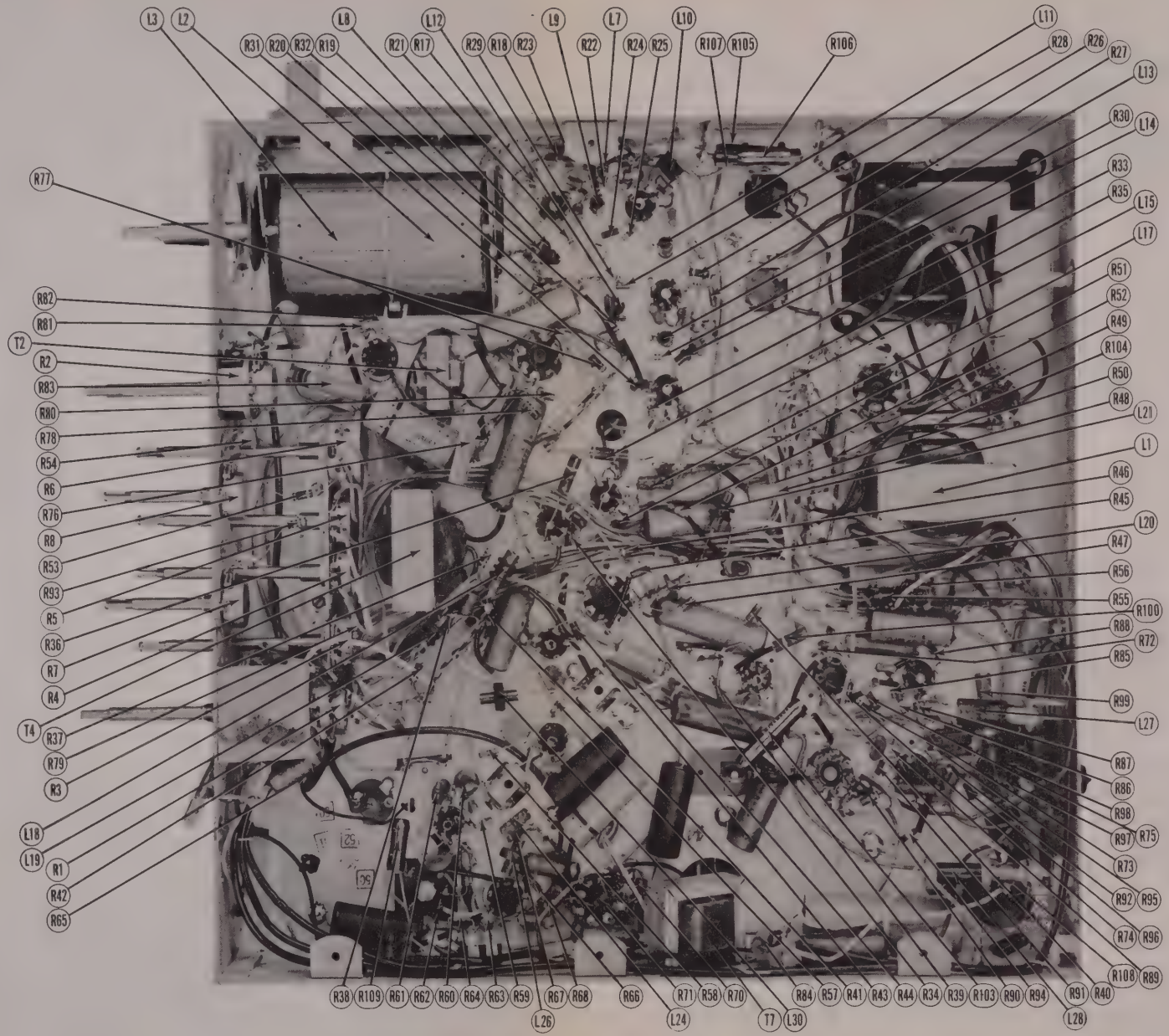
STEWART-WARNER MODELS 9106A, B, 9108A, B, 9109A, B, 9113A

RADIO SCHEMATIC



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PHOTOFACT* Folder

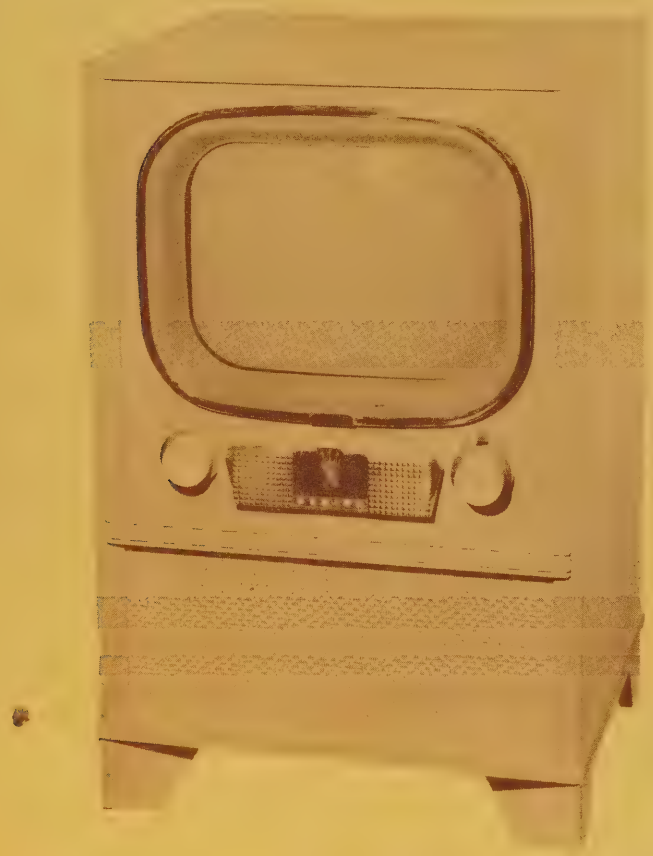
*TRADE MARK

ZENITH MODELS
H2328EZ, RZ, H2352RZ, H2353EZ (CH. 23H22Z)

IMPORTANT FILING NOTICE

The contents for this envelope will be found among the last folders in this complete set of folders . . . *unless* it has been purchased as part of a *complete* volume of PHOTOFACTS assembled in a DeLuxe Binder.

Merely insert the corresponding folder on this model in this envelope to retain proper filing and indexing order.



MODEL H2353EZ

ZENITH MODELS
H2328EZ, RZ, H2352RZ,
H2353EZ (CH. 23H22Z)

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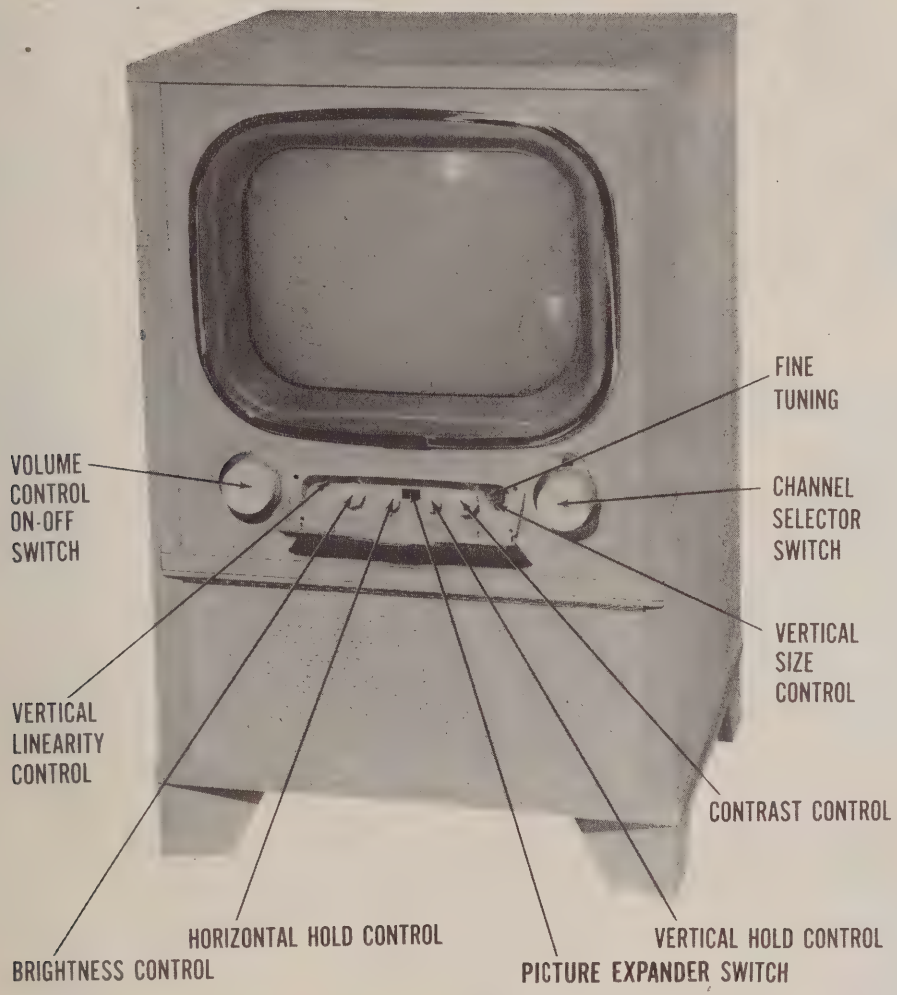
ZENITH MODELS H2328EZ, RZ, H2352RZ, H2353EZ, (Ch. 23H22Z)



ZENITH MODELS H2328EZ, RZ, H2352RZ, H2353EZ, (Ch. 23H22Z)

ZENITH MODEL H2353EZ

TRADE NAME	Zenith Models H2328EZ, H2328RZ, H2352RZ, H2353EZ (Ch. 23H22Z)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Illinois
TYPE SET	Television Receiver
TUBES	Twenty Three
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	2.15 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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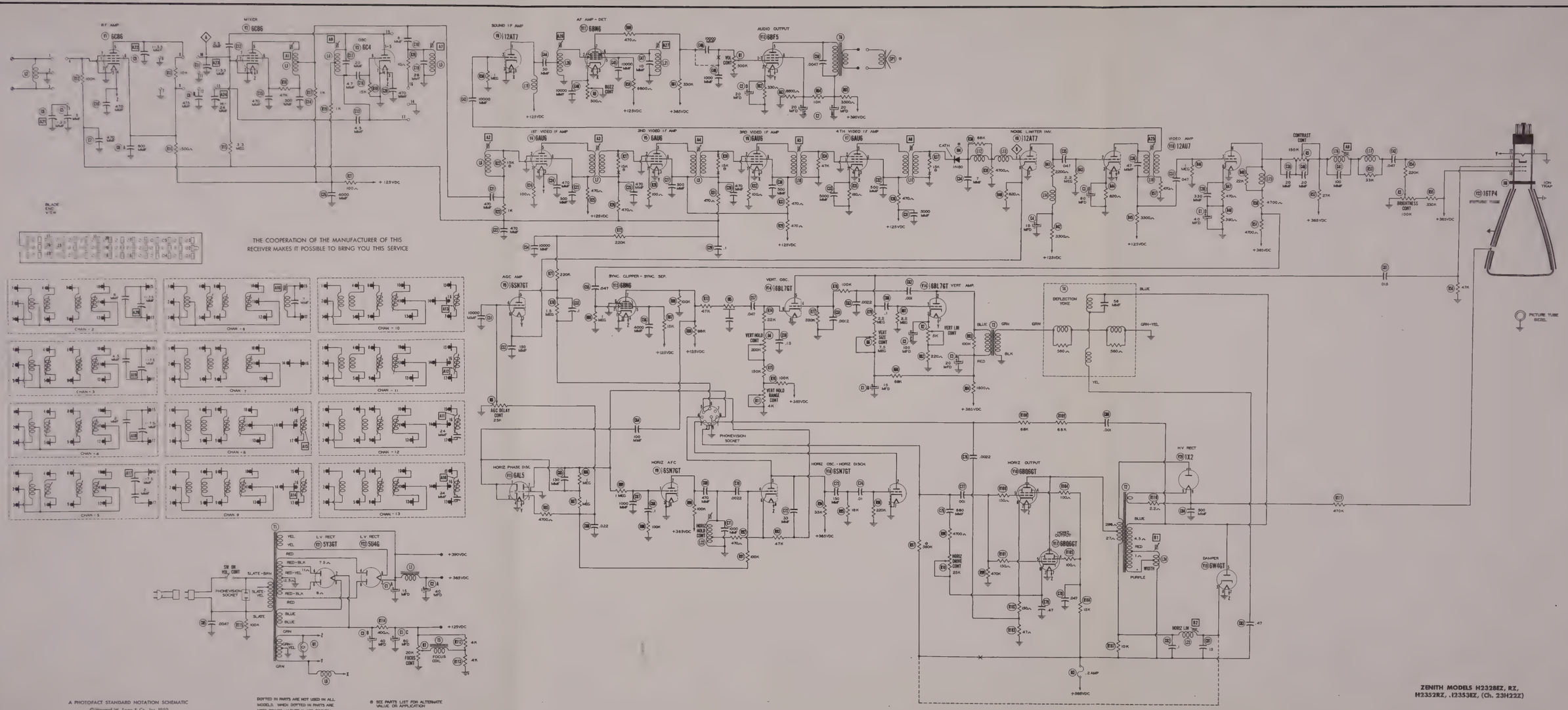
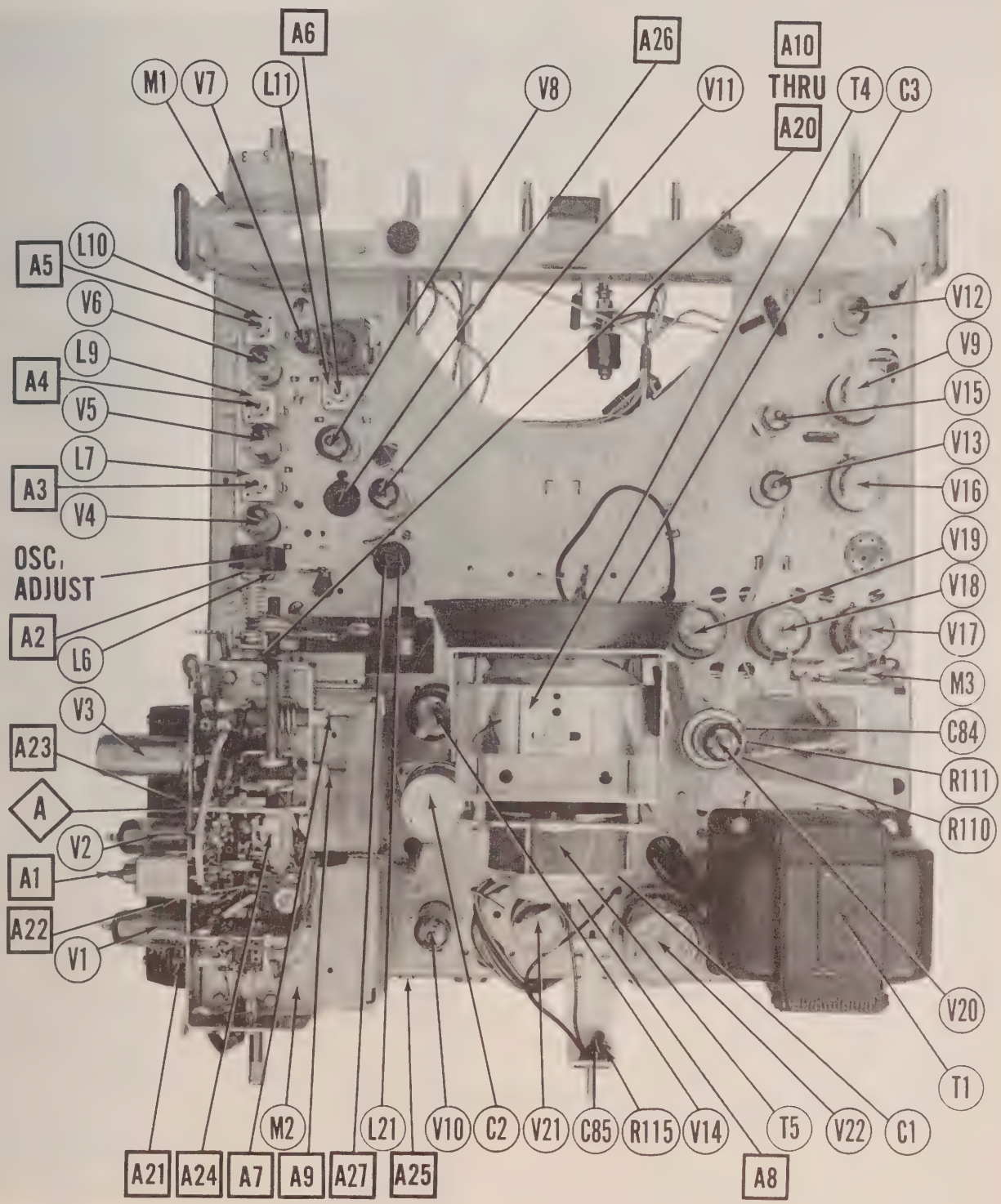
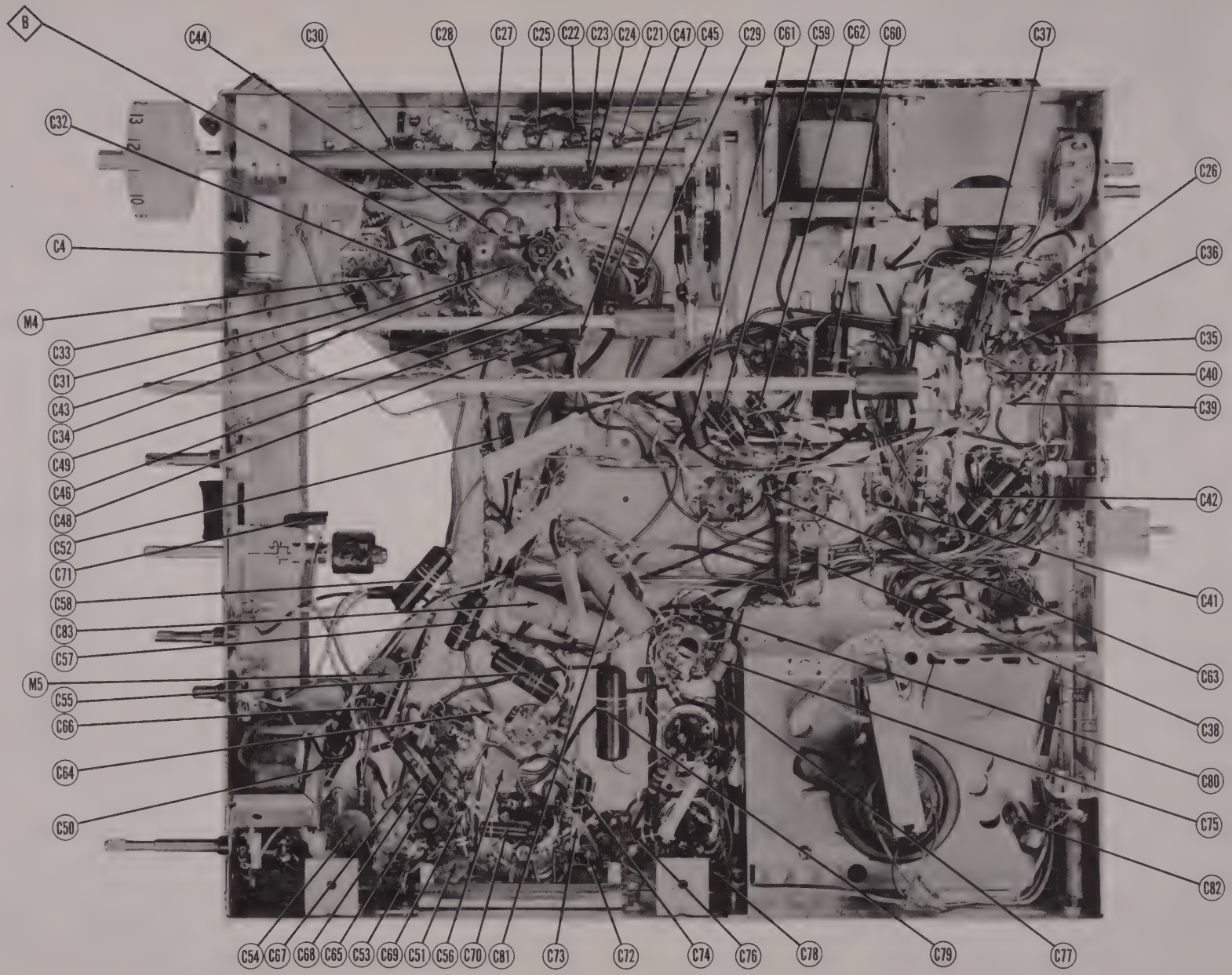


ZENITH MODELS H2328EZ, RZ, H2352RZ, .I2353EZ, (Ch. 23H22Z)

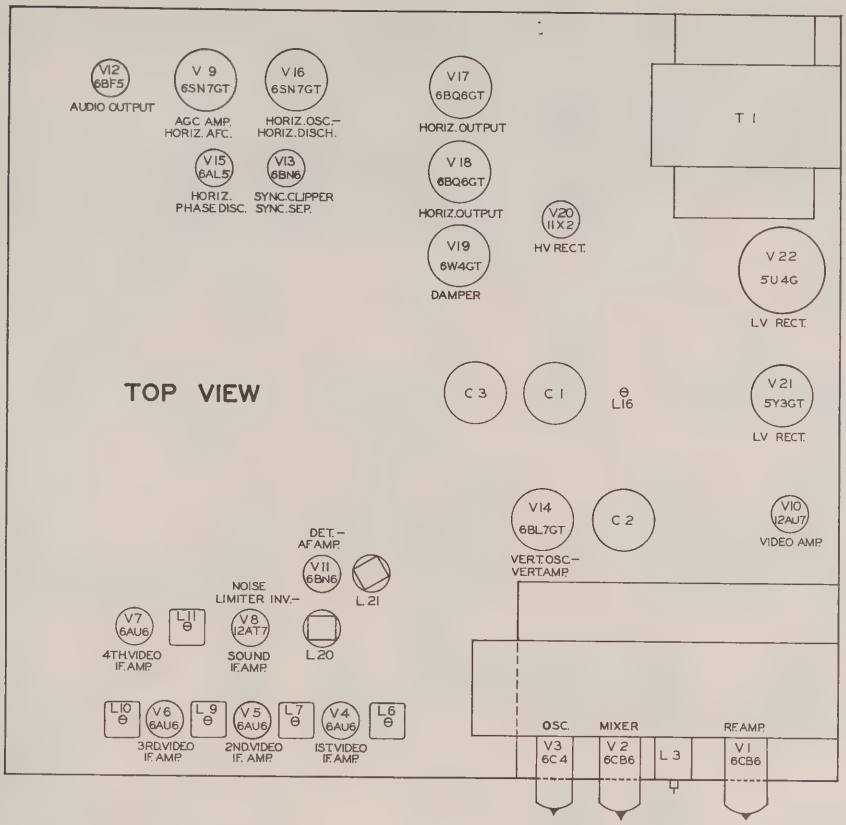
ZENITH MODELS H2328EZ, RZ, H2352RZ, H2353EZ, (Ch. 23H22Z)

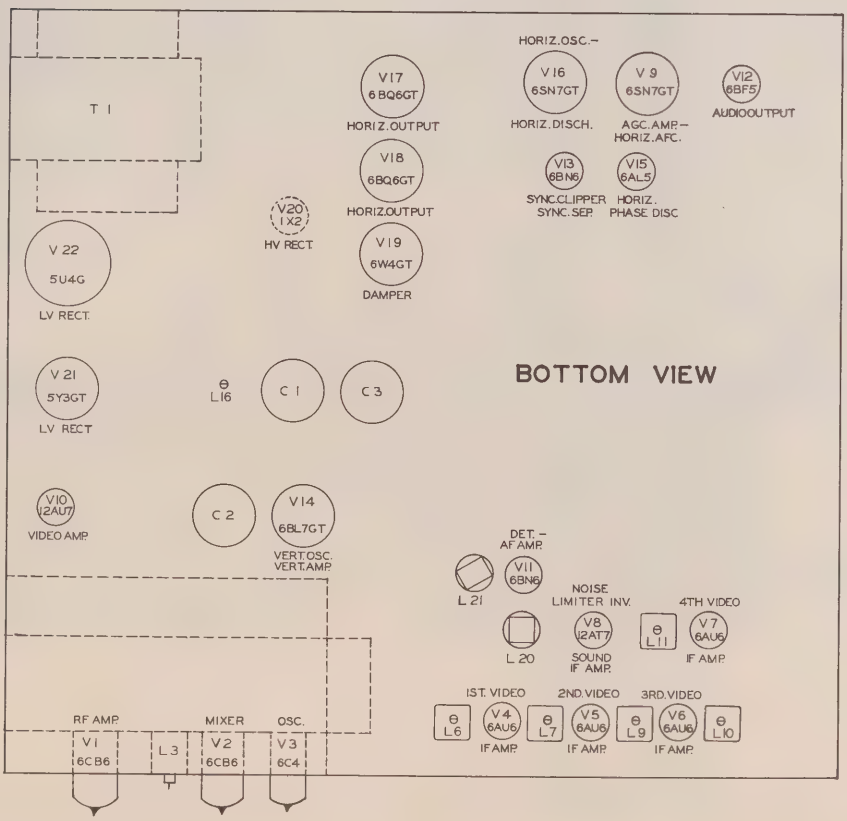


CHASSIS-TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION





TUBE PLACEMENT CHART

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard may be eliminated by removing the horizontal oscillator tube (V16) from its socket.

VIDEO IF ALIGNMENT

Remove the local oscillator tube (V3) from its socket to prevent the possibility of erroneous indications.
Connect the negative lead of a 4.5 volt battery to the junction of R12 and C10, connect the positive lead to chassis.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.05MFD	High side to alignment Point A . Low side to chassis.	44MC (10MC SWP)	42.75MC 43.5MC 45MC 45.75MC	12	Vert. Amp. thru 10KΩ to Point (B). Low side to chassis.	A1, A2, A3, A4, A5, A6	Adjust for response curve similar to figure 1. The low frequency skirt of the response curve is effected by A1, A2, and A4. The high frequency skirt is effected by A3 and A5. The flatness of the center region is effected by A6. The sweep generator should be attenuated to maintain 3 volt peak to peak response on the oscilloscope.
2.	.05MFD	"	"	47.25MC (max. output)	2	"	A7	Adjust for MINIMUM marker indication at the 47.25MC point on response curve.
3.	.05MFD	High side to pin 2 (Grid) of 12AU7 (V10). Low side to chassis.	Not used	4.5MC (Unmod.)	Any	Use VTVM. DC Probe to pin 11 (cathode) of picture tube. Common to chassis.	A8	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Leave the bias battery used during video IF alignment connected.
Replace the local oscillator tube (V3) in its socket.
Turn the fine tuning control until the open spot on the drive pully on tuner shelf is pointing upward.
There is no channel strip oscillator adjustment for channel 7. The oscillator on channel 7 is adjusted with A9. If the oscillator strip adjustment proves inadequate on any channel, and it has been definitely proved that the channel strip is not at fault, compromise adjustment of A9 may be made. If A9 is changed it will be necessary to readjust the channel strip adjustments for all channels. Do not adjust A9 so channel 7 is beyond the range of the fine tuning control.
The channel strip adjustments are made by pressing the oscillator adjust knob inward and turning the knob. Release the knob before switching channels.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	177MC (10MC SWP)	175.25MC 179.75MC	7	Vert. Amp. to Point (B). Low side to chassis.	A9	Adjust to place the video marker at 50% on the response curve as shown in figure 2.
5.	"	"	213MC (10MC SWP)	211.25MC 215.75MC	13	"	A10	Adjust each channel strip adjustment to place the video marker at 50% on the response curve.
			207MC (10MC SWP)	205.25MC 209.75MC	12		A11	
			201MC (10MC SWP)	199.25MC 203.75MC	11		A12	
			195MC (10MC SWP)	193.25MC 197.75MC	10		A13	
			189MC (10MC SWP)	187.25MC 191.75MC	9		A14	
			183MC (10MC SWP)	181.25MC 185.75MC	8		A15	
			85MC (10MC SWP)	83.25MC 87.75MC	6		A16	
			79MC (10MC SWP)	77.25MC 81.75MC	5		A17	
			69MC (10MC SWP)	67.25MC 71.75MC	4		A18	
			63MC (10MC SWP)	61.25MC 65.75MC	3		A19	
			57MC (10MC SWP)	55.25MC 59.75MC	2		A20	

RF ALIGNMENT

Leave the bias battery connected.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Remove the bias battery after completing RF alignment.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω carbon res.	Across antenna terminals with 120Ω in each lead.	213MC (10MC SWP)	211.25MC 215.75MC	13	Vert. Amp. to Point (B). Low side to chassis.	A21, A22, A23, A24	Adjust for maximum amplitude with proper band pass as shown in figure 2. If the response curve seems tilted a similar amount on all channels recheck the video IF alignment. If the sensitivity seems to be low on the high band channels. Adjust A24 for maximum amplitude with proper band width over the high band channels.
			207MC (10MC SWP)	205.25MC 209.75MC	12			
			201MC (10MC SWP)	199.25MC 203.75MC	11			
			195MC (10MC SWP)	193.25MC 197.75MC	10			
			189MC (10MC SWP)	187.25MC 191.75MC	9			
			183MC (10MC SWP)	181.25MC 185.75MC	8			
			177MC (10MC SWP)	175.25MC 179.75MC	7			
			85MC (10MC SWP)	83.25MC 87.75MC	6			
			79MC (10MC SWP)	77.25MC 81.75MC	5			
			69MC (10MC SWP)	67.25MC 71.75MC	4			
			63MC (10MC SWP)	61.25MC 65.75MC	3			
			57MC (10MC SWP)	55.25MC 59.75MC	2			

ALIGNMENT INSTRUCTIONS (CONT.)

AGC FIELD ADJUSTMENT

7. Tune in a local TV station and turn the contrast control to maximum clockwise.
Adjust the AGC control until the picture is below the point of overloading and the contrast is slightly above normal.

AGC SHOP ADJUSTMENT

8. Connect a 10KΩ resistor in series with the oscilloscope vertical input.
Connect an antenna and tune in a local TV station.
Connect the oscilloscope vertical input to Point A , low side to chassis and adjust the AGC control for 2.5 volt peak to peak deflection on the oscilloscope.

SOUND IF ALIGNMENT

9. The sound IF portion fof this receiver can best be aligned by using a TV station signal and attenuater (Zenith part No. S17203) or equivalent. The attenuater should be connected between the antenna and the receiver and adjusted so the signal strength is reduced below the limiting level of the sound limiter-detector. This point will be indicated by a hiss similar to super-regeneration.
Adjust A25, A26 and A27 for maximum audio of best quality. Adjust the "buzz" control (R9) for minimum buzz in the audio signal. If the hiss disappears during any of these adjustments, reduce the signal with the attenuater until the hiss returns. If the buzz cannot be completely eliminated, recheck the AGC adjustment.

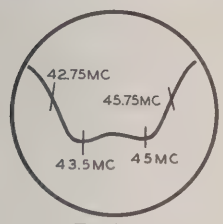


FIG. 1

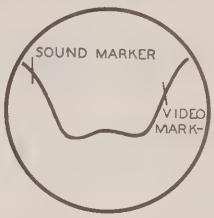
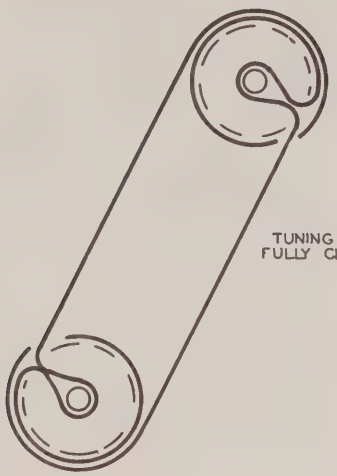
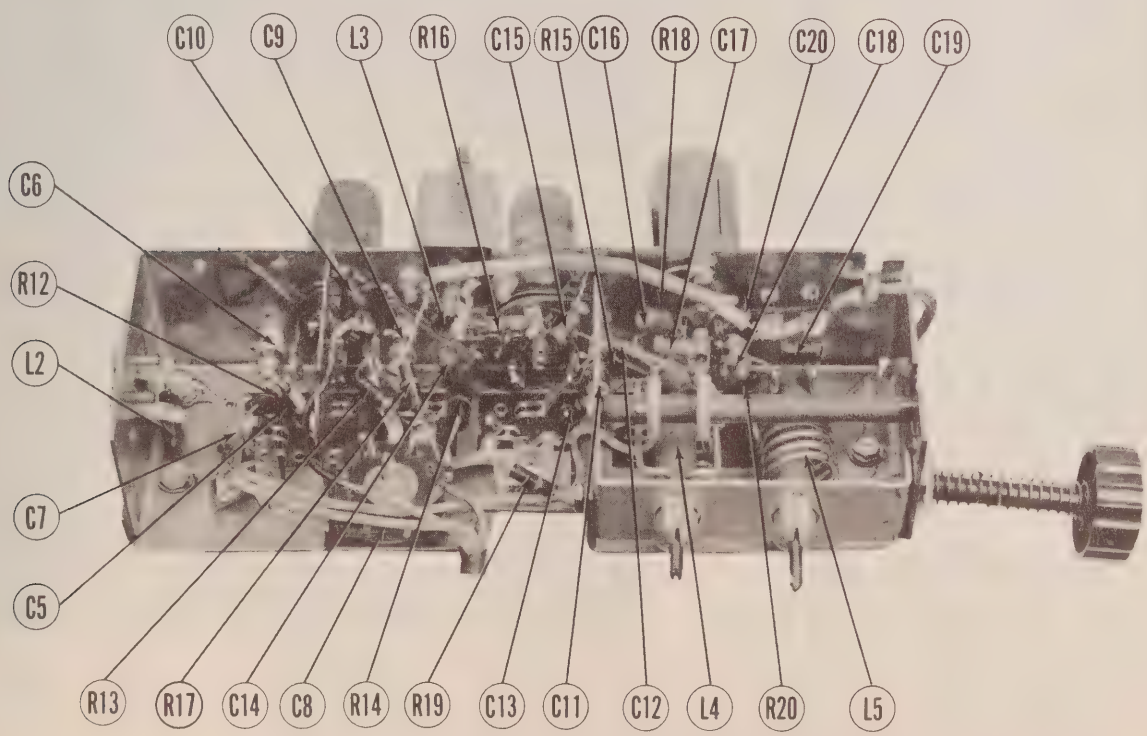


FIG. 2



FINE TUNING DRIVE CORD STRINGING



RF TUNER

VOLTAGE AND RESISTANCE MEASUREMENTS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	-1.6VDC	0V	0V	6.3VAC	120VDC	120VDC	0V		
V 2	6CB6	-5.4VDC	0V	6.3VAC	0V	130VDC	90VDC	0V		
V 3	6C4	110VDC	0V	6.3VAC	0V	110VDC	§-3.6VDC	0V		
V 4	6AU6	-.2VDC	0V	6.3VAC	0V	135VDC	135VDC	.5VDC		
V 5	6AU6	-.2VDC	0V	6.3VAC	0V	135VDC	135VDC	.5VDC		
V 6	6AU6	-.2VDC	0V	6.3VAC	0V	130VDC	130VDC	.4VDC		
V 7	6AU6	0V	0V	6.3VAC	0V	135VDC	135VDC	1.4VDC		
V 8	12AT7	140VDC	-.7VDC	0V	0V	0V	125VDC	-6VDC	2.2VDC	6.3VAC
V 9	6SN7GT	-1VDC	100VDC	0V	-4VDC 0V	-.2VDC	2.2VDC	6.3VAC	0V	
V 10	12AU7	115VDC	0V	3.7VDC	0V	0V	270VDC 255VDC	0V	10VDC	6.3VAC
V 11	6BN6	3.8VDC .8VDC	0V	6.3VAC	0V	85VDC	0V	145VDC		
V 12	6BF5	0V	8VDC	6.3VAC	0V	220VDC	95VDC	0V		
V 13	6BN6	0V	-17VDC	0V	6.3VAC	45VDC	0V	75VDC		
V 14	6BL7GT	0V	330VDC	30VDC 7VDC	-.2VDC	195VDC 135VDC	20VDC 100VDC	6.3VAC	0V	
V 15	6AL5	-2VDC	-3.8VDC	6.3VAC	0V	-2VDC	0V	-1.5VDC		
V 16	6SN7GT	-25VDC	30VDC	0V	-23VDC	250VDC	1.8VDC	0V	6.3VAC	
V 17	6BQ6GT	0V	0V	5.8VDC	140VDC	.4VDC	140VDC	6.3VAC	23VDC	TOP CAP *
V 18	6BQ6GT	0V	0V	-1.3VDC	140VDC	.4VDC	.4VDC	6.3VAC	23VDC	TOP CAP *
V 19	6W4GT	0V	365VDC	555VDC	23VDC 21VDC	365VDC	40VDC	6.3VAC	0V	
V 20	1X2	* DO NOT	MEASURE							
V 21	5Y3GT	6.3VAC	175VDC	6.3VAC	210VAC	0V	210VAC	0V	175VDC	
V 22	5U4G	0V	390VDC	6.3VAC	355VAC	4.4VDC 15VDC	355VAC	365VDC	390VDC	
V 23	16TP4	0V	0V	PIN 10 365VDC	PIN 70VDC	11 0V	PIN 12 6.3VAC			

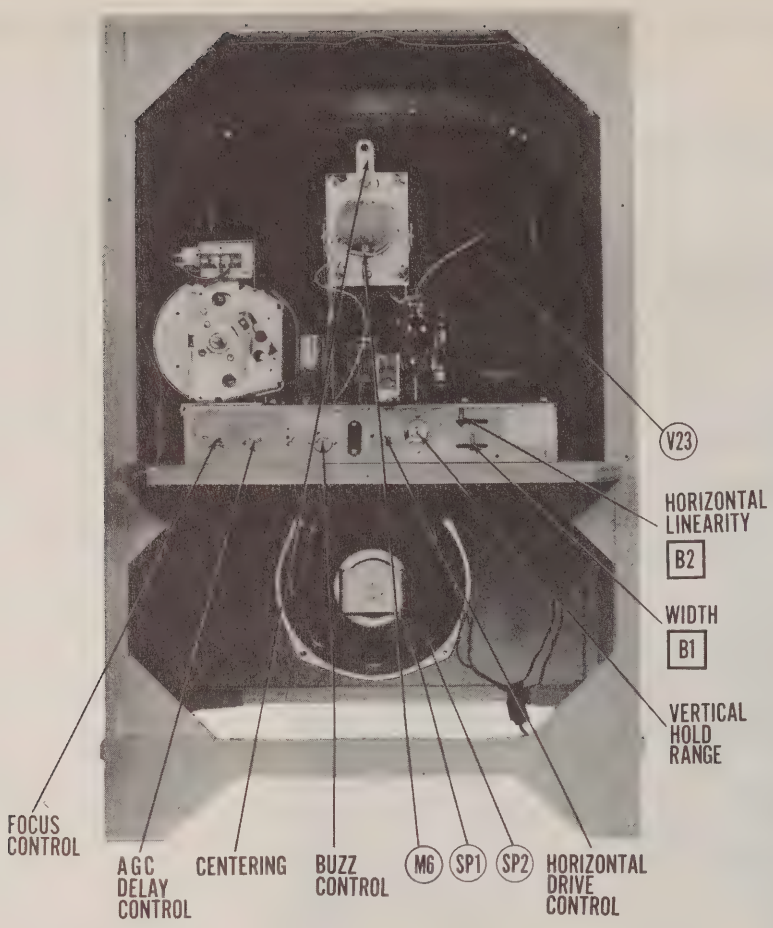
FOCUS CONTROL COUNTERCLOCKWISE
§ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT MEASURE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	2 Meg.	0Ω	0Ω	.1Ω	#2KΩ	#2KΩ	0Ω		
V 2	6CB6	5.3 Meg.	0Ω	.1Ω	0Ω	#1.5KΩ	#48KΩ	0Ω		
V 3	6C4	#1.5KΩ	Inf.	.1Ω	0Ω	#1.5KΩ	15KΩ	0Ω		
V 4	6AU6	2 Meg.	0Ω	.1Ω	0Ω	#870Ω	#870Ω	100Ω		
V 5	6AU6	2 Meg.	0Ω	.1Ω	0Ω	#870Ω	#870Ω	100Ω		
V 6	6AU6	2 Meg.	0Ω	.1Ω	0Ω	#1.3KΩ	#1.3KΩ	100Ω		
V 7	6AU6	.1Ω	0Ω	.1Ω	0Ω	#870Ω	#870Ω	180Ω		
V 8	12AT7	#400Ω	1 Meg.	0Ω	0Ω	0Ω	#5.9KΩ	4.7KΩ	820Ω	.1Ω
V 9	6SN7GT	3 Meg.	†100KΩ	0Ω	25KΩ 0Ω	1.5 Meg.	820Ω	.1Ω	0Ω	
V 10	12AU7	#3.7KΩ	2.2 Meg.	820Ω	0Ω	0Ω	†7KΩ †9KΩ	1 Meg.	860Ω	.1Ω
V 11	6BN6	500Ω 100Ω	6Ω	.1Ω	0Ω	#7.2KΩ	4.7Ω	†330KΩ		
V 12	6BF5	25Ω	330Ω	.1Ω	0Ω	†4.2KΩ	†13KΩ	25Ω		
V 13	6BN6	0Ω	1 Meg.	0Ω	.1Ω	#15KΩ	0Ω	#40KΩ		
V 14	6BL7GT	2.2 Meg.	†2.6KΩ	5.2KΩ 220Ω	330KΩ	†2.2 Meg. †10 Meg.	370KΩ 170KΩ	.1Ω	0Ω	
V 15	6AL5	1 Meg.	30KΩ	.1Ω	0Ω	1 Meg.	0Ω	2 Meg.		
V 16	6SN7GT	220KΩ	†570KΩ	0Ω	125KΩ	†33KΩ	470Ω	0Ω	.1Ω	
V 17	6BQ6GT	Inf.	0Ω	47Ω	†15KΩ	470KΩ	†15KΩ	.1Ω	200Ω	TOP CAP †10KΩ
V 18	6BQ6GT	Inf.	0Ω	2 Meg.	†15KΩ	470KΩ	570KΩ	.1Ω	200Ω	TOP CAP †10KΩ
V 19	6W4GT	2 Meg.	†190Ω	†10KΩ	5KΩ 30KΩ	†200Ω	†560KΩ	.1Ω	0Ω	
V 20	1X2	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	Inf.	TOP CAP †10KΩ
V 21	5Y3GT	.1Ω	4KΩ	.1Ω	13Ω	Inf.	13Ω	Inf.	4KΩ	
V 22	5U4G	Inf.	20KΩ	.1Ω	18Ω	150KΩ	18Ω	†190Ω	20KΩ	
V 23	16TP4	0Ω	47KΩ	PIN 10 †190Ω	PIN 300KΩ	11 220KΩ	PIN 12 .1Ω			

MEASURED FROM PIN 2 OF V21
† MEASURED FROM PIN 2 OF V22

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. Front panels controls set at minimum.
6. Where readings may vary according to the setting of the service controls, both minimum and maximum readings are given.



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Adjust the horizontal hold control until the picture synchronizes horizontally.

Adjust the horizontal drive control clockwise as far as possible without causing fold-over or instability in the picture.

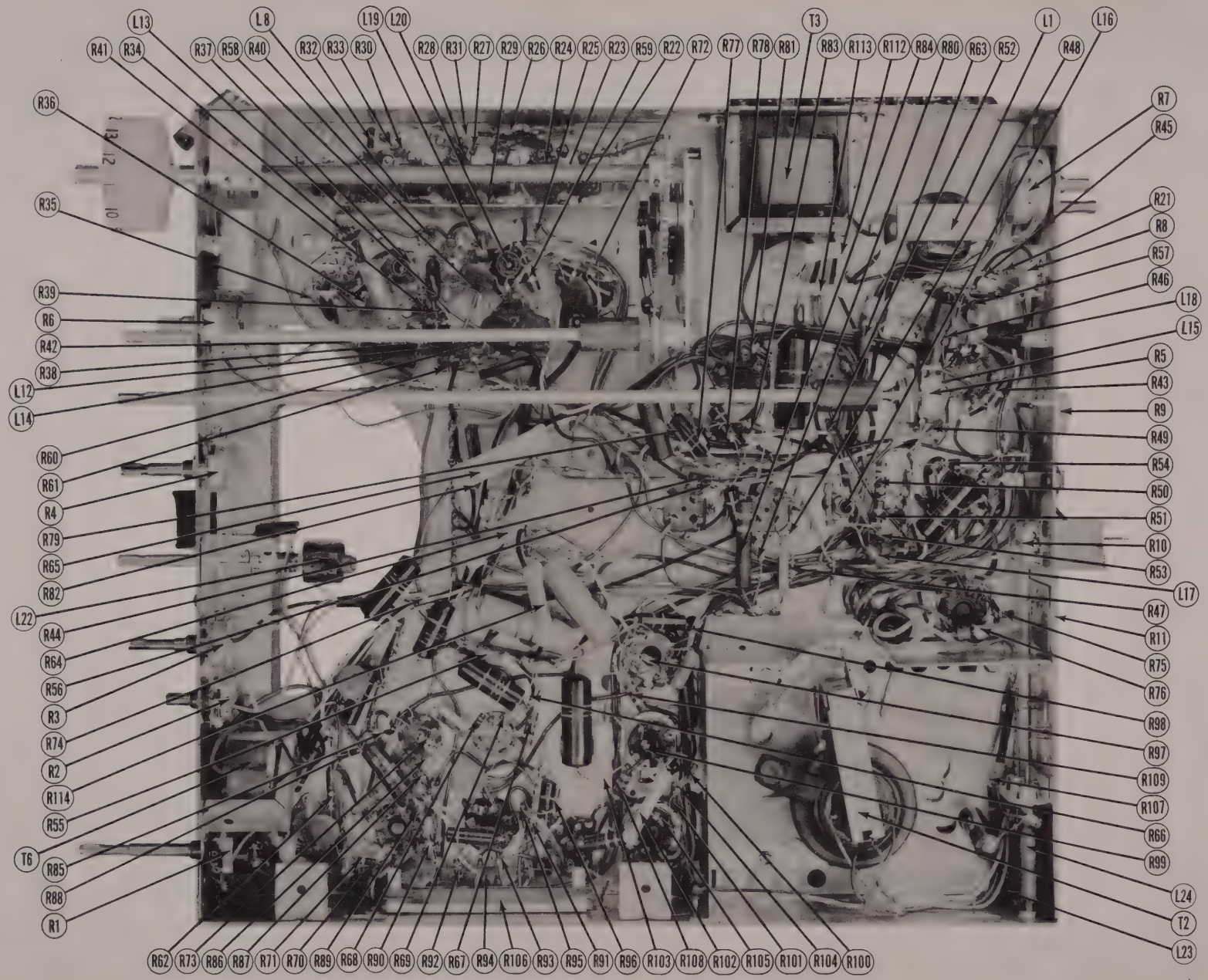
Adjust the width adjustment (B1) until the picture fills the tube horizontally.

Adjust the horizontal linearity adjustment (B2) until the picture is symmetrical from left to right. The horizontal drive control and adjustments B1 and B2 are all interacting. Alternate adjustment may be required to obtain optium results.

DISASSEMBLY INSTRUCTIONS

1. Remove seven push-on type control knobs.
2. Remove seven wood screws holding rear cover in place. Remove rear cover.
3. Disconnect built-in antenna.
4. Remove antenna terminal strip.
5. Disconnect speaker leads.
6. Remove four 3/8" hex head screws from chassis. Remove chassis.
7. Remove four 5/16 " hex nuts from speaker. Remove speaker.

NOTE: FOR PICTURE TUBE REMOVAL, FOLLOW INSTRUCTIONS ABOVE.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amp.	6CB6	6CB6	6CK	
V2	Mixer	6CB6	6CB6	6CK	
V3	Oscillator	6C4	6C4	6BG	
V4	1st Video IF	6AU6	6AU6	7BK	
V5	2nd Video IF	6AU6	6AU6	7BK	
V6	3rd Video IF	6AU6	6AU6	7BK	
V7	4th Video IF	6AU6	6AU6	7BK	
V8	Noise Limiter-Inv.-Sound IF Amp.	12AT7	12AT7	7BT	
V9	AGC-Amp.-Hor. AFC	6SN7GT	6SN7GT	8BD	
V10	Video Amp.	12AU7	12AU7	9A	
V11	AF Amp.-Det.	6BN6	6BN6	7DF	
V12	Audio Output	6BF7	6BF7	8BD	
V13	Sync. Clipper-Sync. Sep.	6BN6	6BN6	7DF	
V14	Vert. Osc.-Vert. Amp.	6BL7GT	6BL7GT	8BD	
V15	Hor. Phase Discr.	6AL5	6AL5	6BJ	
V16	Hor. Osc.-Hor. Disch.	6SN7GT	6SN7GT	8BD	
V17	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V18	Hor. Output	6BQ6GT	6BQ6GT	6AM	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rect.	1X2	1X2	7CB	
V21	LV Rect.	5Y3GT	5Y3GT	5T	
V22	LV Rect.	5U4G	5U4G	5T	
V23	Picture Tube	16TP4	16TP4	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C1A	15	475	22-2122	AF33X16G3B		UPT417		TVL-4815	▲ Filter
B	15	475							■ Vert. Osc. Dec.
C	80	300							▲ Filter
D	40	50							V. Amp. Cath.
C2A	40	450	22-2224	AFH84J4E4A		UPT422		TVL-4732	▲ Filter
B	20	450				45C			■ Filter
C	20	200							▲ Output Screen Byp.
D	20	25							■ Filter
C3A	20	475	22-2223	AF4X8G20B		UPT422			▲ Decoupling
B	40	300		16A					■ Filter
C	100	50							▲ Vert. Output Cath.
D	80	25							V. Amp. Cath.
C4	10	250	22-2154	PRS250/12		BR1025		TVA-1504	Noise Limiter Dec.
C5	5		22-2050	SI5NPO	TCZ-5		NPOK-5		Fixed Padder
C6	1-3.5		22-2093		829-4				Variable Padder
C7	470		22-2219	SI470	D6-471		GP2K-470	19C15	AGC Filter
C8A	600		27-82						RF Amp. Dec.
B	475		27-69						RF Bypass
C9	1-3.5		22-2093		829-4				Variable Trimmer
C10	470		22-2219	SI470	D6-471		GP2K-470	19C15	RF Amp. Fil.
C11	1-3.5		22-2093		829-4				Variable Trimmer
C12	2.5		22-1891				N030K-2.5		Osc. Coupling
C13	4.5		22-2207				N750K-4.5		Osc. Coupling
C14	500		22-2216	SI500	D6-501		GP2K-500	19C32	Mixer Screen Dec.
C15	470		22-2219	SI470	D6-471		GP2K-470	19C15	Mixer Screen Dec.
C16	47		22-1876	SI47	D6-470		GP1K-47	19C25	Osc. Grid Cap.
C17	20		22-2204				N030K-20.		Fixed Trimmer
C18	6		22-2051				NPOK-6		RF Coupling
C19	26		22-2155				N080K-26		Fixed Trimmer
C20	470		22-2219	SI470	D6-471	5W5T5	GP2K-470	19C15	Osc. Fil. Bypass
C21	470		22-2217	SI470	D6-471	5W5T5	GP2K-470	19C15	IF Coupling
C22	470		22-2143	SI470	D6-471	5W5T5	GP2K-470	19C15	AGC Filter
C23	500		22-2216	SI500	D6-501	5W5T5	GP2K-500	19C32	1st V. IF Dec.
C24	470		22-2143	SI470	D6-471	5W5T5	GP2K-470	19C15	1st V. IF Fil.
C25	470		22-2143	SI470	D6-471	5W5T5	GP2K-470	19C15	AGC Filter
C26	4000		22-4	BPD-004	DD-502	1D5D4	811-005	29C1	RF Bypass
C27	500		22-2216	SI500	D6-501	5W5T5	GP2K-500	19C32	2nd V. IF Dec.
C28	470		22-2143	SI470	D6-471	5W5T5	GP2K-470	19C15	AGC Filter
C29	.1	200	22-1777	P288-1	DF-104	PTE4P1		2TM-P1	AGC Filter
C30	500		22-2216	SI500	D6-501	5W5T5	GP2K-500	19C32	3rd V. IF Dec.
C31	5000		22-4	BPD-005	DD-502	1D5D5	811-005	29C1	RF Bypass
C32	500		22-2216	SI500	D6-501	5W5T5	GP2K-500	19C32	4th V. IF Dec.
C33	5000		22-4	BPD-005	DD-502	1D5D5	811-005	29C1	4th V. IF Cath.
C34	7		22-1874	SI6.8NPO	TCZ-6.8	5W5Q1	NPOK-6.8	19C19	V. Diode Filter
C35	.047	600	22-1844	P688-047	DF-503	PTE6S5		6TM-S47	Video Coupling
C36	47		22-1876	SI50NPO	TCZ-47	5R5Q5	N080-338-47	29C14	Fixed Trimmer
C37	.047	600	22-1844	P688-047	DF-503	PTE6S5		6TM-S47	Video Coupling
C38	330	500	22-1645	1468-00036	D6-331	5W5T3	GP2K-330	19C14	V. Amp. Cath.
C39	20		22-2233	SI20	D6-200	5W5Q2	GP1K-20	MS-42	Peaking
C40	20		22-2233	SI20	D6-200	5W5Q2	GP1K-20	MS-42	Peaking
C41	100		22-2234	SI100NPO	TCZ-100	5R5T1	NPOM-100	36C10	Fixed Trimmer
C42	.047	600	22-1844	P688-047	DF-503	PTE6S5		6TM-S47	Video Coupling
C43	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	S. IF Coupling
C44	50		22-1761	SI50	D6-500	5W5Q5	GP1K-50	19C28	S. IF Coupling
C45	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	FM Det. Screen
C46	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	FM Det. Catch.
C47	10		22-2106				N150K-10		Fixed Trimmer
C48	1000		22-2218	SI1000	D6-102	1W5D1	GP2L-001	19C1	De-emphasis
C49	10000		22-3	BPD-01	DD-103	PTE6S1	811-01	36C1	Audio Coupling
C50	.0047	600	22-1782	P688-047	DF-503	PTE6S5		6TM-S47	Output Plate Byp.
C51	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	AGC Amp. Grid
C52	150	500	22-1137	1468-00015	D6-151	5W5T15	GP2K-150	1FM-315	Cathode Bypass
C53	.1	200	22-1810	P288-1	DF-104	PTE4P1		2TM-P1	Hor. Sweep Coupling
C54	10000		22-3	BPD-01	DD-103	PTE4S1	811-01	36C1	AGC Filter
C55	.047	600	22-1844	P688-047	DF-503	PTE6S5		6TM-S47	Sync. Coupling

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	SPRAGUE PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
C56	4000		22-4	BPD-004	DD-502	1D5D4	811-005	29C1	Sync. Sep. Screen
C57	.047	400	22-1775	P488-047	DF-503	PTE4S5		4TM-S47	Vert. Sync. Coupling
C58	.15	200	22-2166	P288-15		GT4P3		2TM-P15	Vert. MV Cath.
C59	.0012	600	22-1880	P688-0015	D6-122		GP2L-0012	6TM-D15	Vert. MV Grid
C60	.1	600	22-1841	P688-1	DF-104	PTE6P1		6TM-P1	Vert. Sweep Coupling
C61	.015	600	22-2264	P688-015		PTE6S15		6TM-S15	Vert. Sweep Coupling
C62	.001	600	22-2128	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Vert. Feedback
C63	.0022	600	22-1814	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Voltage Divider
C64	100	500	22-365	1468-0001	D6-101	5W5T1	GP1K-100	1FM-31	Hor. Sync. Coupling
C65	130	500	22-2162		TCZ-130				AFC Filter
C66	.022	200	22-2071	P488-022	DF-203	PTE4S2		4TM-S22	AFC Filter
C67	1000		22-2112	SI1000	D6-102	1W5D1	GP2L-001	19C1	AFC Filter
C68	.1	200	22-1777	P288-1	DF-104	PTE4P1		2TM-P1	AFC Filter
C69	470	500	22-1138	1468-0005	D6-471	5W5T5	GP2K-470	1FM-35	AFC Coupling
C70	.0022	600	22-1845	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Hor. Osc. Grid Cap.
C71	1000	500	22-2163	1464-001		2R5D1		MS-21	Fixed Trimmer
C72	33		22-2168	SI33	D6-330	5W5Q4	GP1K-33	19C24	Hor. Sweep Coupling
C73	150	500	22-470	1468-0001 5	D6-151	5W5T15	GP2K-150	1FM-315	Differentiator Net.
C74	.01	400	22-1846	P488-01	D6-103	PTE4S1	811-01	4TM-S1	Hor. Sweep Coupling
C75	680	500	22-2034	SI680	D6-681	1W5T7	GP2K-680	1FM-37	Hor. Discharge
C76	.0022	600	22-1814	P688-0022	D6-222	PTE6D2	GP2M-0022	6TM-D22	Voltage Divider
C77	.001	1000	22-1851	P1088-001		PTE16D1		MB-D1	Hor. Sweep Coupling
C78	.047	600	22-1844	P688-047	DF-503	PTE6S5		6TM-S47	Hor. Output Screen
C79	.47	200	22-2146	P288-47		GT2P5		2TM-P47	Hor. Output Cath.
C80	.001	600	22-2128	P688-001	D6-102	PTE6D1	GP2L-001	6TM-D1	Hor. Feedback
C81	.15	400	22-2166	P488-15				4TM-P15	Damper Filter
C82	.1	400	22-2061	P488-1		PTE4P1		4TM-P1	Damper Filter
C83	.47	200	22-2098	P288-47		GT2P5		2TM-P47	Hor. Sweep Coupling
C84	500	20000	22-2120	HV20C	TV3-502				HV Filter
C85	.0047	600	22-1782	P688-0047	D6-472	PTE6D 5	GP2M-0047	6TM-D47	Line Filter

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	INSTALLATION NOTES
R1A	500KΩ	½	63-2125	QI3-133	AG-60-Z	BSK-60-S	Volume control
B	Shaft		Not Req.	Not Req.	KS8-3	AK-16 Coupler	Attach to R1A per instructions
C	Switch		Not Req.	76-1	SWB	AK-16 Coupler	Attach to R1A per instructions
R2A	5000Ω	½	63-1674	QII-114	AG-19-S	AN-10	Vert. linearity control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R2A per instructions
R3A	100KΩ	½	63-2126	QII-128	AG-49-S	SB-220	Brightness control
B	Shaft		Not Req.	Not Req.	KS8-3	Not Req.	Attach to R3A per instructions
R4A	200KΩ	½	63-2127		AG-52-S	SB-221	Vert. hold control
B	Shaft		Not Req.		KS8-3	Not Req.	Attach to R4A per instructions
R5	150KΩ	½	63-2123			SBT-217	Contrast control-tapped at 100KΩ and 125KΩ
R6	7.5 Meg.	½	63-2110			SB-204	Vert. size control
R7	20KΩ	4	63-2099		RTV-127	SVP-996	Focus control-Wire Wound
R8A	25KΩ	½	63-2153	QII-120	AG-40-S	AN-26	AGC Delay Control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R8A per instructions
R9	500Ω	1	63-2060				Buzz control-Min. resistance 100Ω, Wire Wound
R10A	25KΩ	½	63-1675	QII-120	AG-40-S	AN-26	Horiz. drive control
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Attach to R10A per instructions
R11	4000Ω	1	63-1690				Vert. hold range control-Wire Wound

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	IDENTIFICATION CODES ALL RESISTORS ARE ± 10% UNLESS OTHERWISE STATED
R12	100KΩ	½	63-1870		RF Amp. Grid
R13	10KΩ	½	63-1827		RF Amp. Plate
R14	1500Ω	½	63-1967	BTS-1500	RF Amp. Decoupling
R15	3.3 Meg. 20%	½	63-1933		Mixer Grid
R16	47KΩ	½	63-1855		Mixer Screen
R17	1000Ω	½	63-1785	BTS-1000	Mixer Decoupling
R18	15KΩ 20%	½	63-1835		Osc. Grid
R19	1000Ω	½	63-1785	BTS-1000	Osc. Plate Decoupling
R20	10Ω 20%	½	63-1702		Parasitic Suppressor
R21	100Ω 20%	½	63-1743	BTS-100	Decoupling
R22	15KΩ	½	63-1834		1st Video IF Coil Shunt-See Note 1
R23	1000Ω	½	63-1785	BTS-1000	AGC Network
R24	100Ω	½	63-1743	BTS-100	1st Video IF Amp. Cathode
R25	470Ω 20%	½	63-1772	BTS-470	1st Video IF Amp. Decoupling
R26	470Ω 20%	½	63-1772	BTS-470	AGC Network
R27	15KΩ	½	63-1834		2nd Video IF Transformer Shunt-See Note 2
R28	100Ω	½	63-1743	BTS-100	2nd Video IF Amp. Cathode
R29	470Ω 20%	½	63-1772	BTS-470	Decoupling
R30	15KΩ	½	63-1834		3rd Video IF Transformer Shunt-See Note 2
R31	470Ω 20%	½	63-1772	BTS-470	AGC Network
R32	100Ω	½	63-1743	BTS-100	3rd Video IF Amp. Cathode
R33	470Ω 20%	½	63-1772	BTS-470	3rd Video IF Amp. Decoupling
R34	47KΩ	½	63-1855		4th Video IF Transformer Shunt
R35	180Ω	½	63-1754	BTS-180	4th Video IF Amp. Cathode
R36	470Ω 20%	½	63-1772	BTS-470	4th Video IF Amp. Decoupling
R37	15KΩ	½	63-1834		5th Video IF Transformer Shunt-See Note 2
R38	68KΩ	½	63-1862		Video Peaking Coil Shunt
R39	4700Ω	½	63-1813	BTS-4700	Video Det. Load
R40	820Ω	½	63-1782	BTS-820	AGC Network
R41	2200Ω	½	63-1799	BTS-2200	Noise Limiter Plate
R42	3300Ω	½	63-1806	BTS-3300	Noise Limiter Plate Decoupling
R43	2.2 Meg.	1	63-1926	BTA-2.2 Meg.	Video Amp. Grid
R44	820Ω	½	63-1782	BTS-820	Video Amp. Cathode
R45	3300Ω	½	63-1806	BTS-3300	Video Amp. Plate
R46	1 Meg. 20%	½	63-1912	BTS-1 Meg.	Video Amp. Grid
R47	470Ω	½	63-1771	BTS-470	Video Amp. Cathode
R48	390Ω	½	63-1766	BTS-390	Video Amp. Cathode
R49	22KΩ	½	63-1841	BTS-22K	Video Peaking Coil Shunt
R50	4700Ω	1	63-943	BTA-4700	Video Amp. Plate
R51	4700Ω	1	63-943	BTA-4700	Video Amp. Plate

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	IDENTIFICATION CODES
R52	27KΩ	½	63-1845	BTS-27K	Voltage Divider
R53	33KΩ	½	63-1848	BTS-33K	Video Peaking Coil Shunt
R54	220KΩ	½	63-1883	BTS-220K	Picture Tube Cathode
R55	330KΩ	½	63-1890	BTS-330K	Voltage Divider
R56	47KΩ	½	63-1855	BTS-47K	Picture Tube Grid
R57	470Ω	½	63-1771	BTS-470	Isolation
R58	1 Meg. 20%	½	63-1912		Sound IF Amp. Grid
R59	6800Ω	1	63-1571	BTA-6800	AF Amp. Screen
R60	470Ω	½	63-1771	BTS-470	Isolation
R61	330KΩ	½	63-1890	BTS-330K	AF Amp. Plate
R62	330Ω	½	63-1764	BTS-330	Audio Output Cathode
R63	6800Ω	2	63-1571	BTB-6800	Voltage Divider
R64	10KΩ	5	63-2022	1 3/4A-10K	Audio Output Screen-Wire Wound
R65	3500Ω	10	63-2023	1 3/4A-3500	Filter-Wire Wound
R66	1 Meg.	½	63-1911	BTS-1 Meg.	Sync. Clipper Grid
R67	15KΩ	1	63-1065	BTA-15K	Sync. Clipper Screen
R68	100KΩ	½	63-1869	BTS-100K	Voltage Divider
R69	68KΩ	½	63-1862	BTS-68K	Sync. Clipper Plate
R70	1.5 Meg. 20%	½	63-1919	BTS-1 .5 Meg.	AGC Network
R71	220KΩ 20%	½	63-1884	BTS-220K	AGC Network
R72	220KΩ 20%	½	63-1884	BTS-220K	AGC Network
R73	47KΩ	½	63-1855	BTS-47K	Integrator
R74	22KΩ	½	63-1841	BTS-22K	Vert. Osc. Cathode
R75	150KΩ	½	63-1876	BTS-150K	Voltage Divider
R76	100KΩ	½	63-1982	BTB-100K	Voltage Divider
R77	330KΩ	½	63-1890	BTS-330K	Vert. Osc. Grid
R78	100KΩ	½	63-1869	BTS-100K	Vert. Peaking
R79	2.2 Meg. 20%	½	63-1926	BTS-2.2 Meg.	Vert. Osc. Plate
R80	68KΩ 20%	½	63-1863	BTS-68K	Vert. Osc. Plate Decoupling
R81	2.2 Meg.	1	63-1926	BTA-2.2 Meg.	Vert. Amp. Grid
R82	220Ω 20%	½	63-1756	BTS-220	Vert. Amp. Cathode
R83	100KΩ	½	63-1869	BTS-100K	Vert. Transformer Shunt
R84	1800Ω	2	63-1620	BTB-1800	Decoupling
R85	4700Ω	½	63-1813	BTS-4700	Horiz. Sync. Disc. Load
R86	1 Meg.	½	63-1911	BTS-1 Meg.	Horiz. Sync. Disc. Load
R87	1 Meg.	½	63-1911	BTS-1 Meg.	Horiz. Sync. Disc. Load
R88	100KΩ 20%	½	63-1870	BTS-100K	Horiz. AFC Filter Network
R89	1 Meg.	½	63-1911	BTS-1 Meg.	Horiz. AFC Grid
R90	100KΩ	1	63-2137	BTA-100K	Horiz. AFC Plate
R91	100KΩ	½	63-1869	BTS-100K	Horiz. Osc. Grid
R92	470Ω	½	63-1771	BTS-470	Horiz. Osc. Cathode
R93	47KΩ	½	63-1855	BTS-47K	Voltage Divider
R94	33KΩ	1	63-957	BTA-33K	Horiz. Osc. Plate
R95	18KΩ	½	63-1838	BTS-18K	Differentiator
R96	220KΩ 20%	½	63-1758	BTS-220K	Horiz. Disch. Grid
R97	560KΩ	½		BTS-560K	Horiz. Disch. Plate-See Note 3
R98	4700Ω	½	63-1813	BTS-4700	Horiz. Peaking
R99	470KΩ 20%	½	63-1898	BTS-470K	Horiz. Output Grid
R100	150Ω 20%	½	63-1751		Parasitic Suppressor
R101	150Ω 20%	½	63-1751		Parasitic Suppressor
R102	150Ω	5	63-2134	1 3/4A-150	Horiz. Output Cathode- Wire Wound
R103	47Ω	1	63-970	BW-1-47	Horiz. Output Cathode-Wire Wound
R104	100Ω 20%	½	63-1744		Parasitic Suppressor
R105	100Ω 20%	½	63-1744		Parasitic Suppressor
R106	15KΩ	10	63-2135	1 3/4A-15K	Horiz. Output Screen-Wire Wound
R107	10KΩ 20%	2	63-2145	BTB-10K	Voltage Divider
R108	68KΩ	1	63-1979	BTA-68K	Feedback
R109	68KΩ	1	63-1979	BTA-68K	Feedback
R110	2.2Ω	½	63-2114		HV Rect. Filament-Wire Wound
R111	470KΩ 20%	½	63-1898		HV Filter
R112	4000Ω	5	63-2017	1 3/4A-4000	Focus Coil Shunt-Wire Wound
R113	4000Ω	5	63-2017	1 3/4A-4000	Focus Coil Shunt-Wire Wound
R114	400Ω	5	63-2077	1 3/4A-400	Filter-Wire Wound
R115	100KΩ 20%	½	63-1870	BTS-100K	Line Isolation

Note 1. Some models use a 33KΩ resistor in this application.
Note 2. Not used in all models.
Note 3. Some models use a 680KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.
T1	117VAC	730VCT	5VAC	5VAC	95-1260			TP-358
	② 2.15A	.190ADC	③3A	④ 2A				
		Tap ④		SEC. 4				
		430VCT		12.6VCT				
		.100ADC		⑤ 6A				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: MERIT PART No.	REPLACEMENT DATA: CHICAGO PART No.	NOTES
T2	320Ω	5.5Ω	S-17435		HVO-6		Hor. Output Trans.
	Tap ② 27Ω	Tap ④ 1Ω					
		SEC. 2 0Ω					
T3	610Ω	13Ω	95-1239	A-8112 ①	A-3038	TSO-5	Vert. Output Trans.
T4A	16Ω		95-1263	DY-7	MD-70F		Hor. Deflection Coil
B	52Ω						Vert. Deflection Coil
T5	3300Ω		S-17290				Focus Coil

① Drill one new mounting hole.

PARTS LIST CONTINUED ON PAGE 15

ZENITH MODELS H2328EZ, RZ, H2352RZ, H2353EZ, (Ch. 23H22Z)

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
	PRI.	SEC.	PRI.	SEC.					
T6	9000Ω	4.3Ω	700Ω	.7Ω	95-1238	A-3879 ①	A-3020 ①	RO-16 ①	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			NOTES
	FIELD RES.	V. C. IMP.	ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
SP1A	PM	4.3Ω	49-649 ②	ST-120 MOD. P10-S	10A4A	② Used in models H2353EZ, H2352RZ.
B	PM		49-679 ③			③ Used in models H2328RZ, H2328EZ.
	CONE DIA.	V. C. DIA.				
SP2A	9 1/4"	1"				
B	5"					

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	
L1	.190ADC	194Ω	3.5 Henries	95-1170	C-2325 ①	C-2991 ①	TR-4200①	① Drill one new mounting hole.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ZENITH PART No.	MEISSNER PART No.	
L2	Ant. Coil	.4Ω		S-17173		
L3	Conv. Plate	.2Ω		S-17104		Tap at .1Ω
L4	Osc. Coil	0Ω		S-16265		
L5	Trap Coil	0Ω		S-16501		
L6	1st Video IF	.1Ω		S-16274		
L7	2nd Video IF	.1Ω	.1Ω	S-16275		
L8	Fil. Choke	.1Ω		S-16984		
L9	3rd Video IF	.1Ω	.1Ω	S-16604		
L10	4th Video IF	.1Ω	.1Ω	S-16605		
L11	5th Video IF	.1Ω		S-17472		
L12	Peaking	9Ω		S-17504		
L13	Peaking	1.6Ω		S-15128		
L14	Peaking	5.3Ω		S-17505		
L15	Peaking	17Ω		S-17053		
L16	4.5MC Trap	1.6Ω		S-17116		
L17	Peaking	7.8Ω		S-17052		
L18	1st Sound IF	1.8Ω	.8Ω	S-16855		
L19	RF Choke	7.9Ω		S-16011		
L20	2nd Sound IF	6Ω		S-16738		Tap at 2.2Ω
L21	Quadrature Coil	4.7Ω		S-16013		
L22	Horiz. Osc.	138Ω		S-17114		Tap at 57Ω (Horiz. hold control)
L23	Horiz. Lin.	10Ω		S-17176		
L24	Width Coil	6.7Ω		S-17175		Tap at 5.7Ω

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					ZENITH PART No.		
M1	Bayonet	6-8	.15	Brown	100-67		Type #47

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M2	RF Tuner		
M3	Fuse		.2A 250V Type 3AG
M4A	Crystal		Video Det. 1N-60
B	Crystal	103-1	Video Det. 1N-64
M5	Integrator Unit	87-1	
M6	Ion Trap	S-17461	
	Turret Tuner Strip	S-16862	Channel 2
	Turret Tuner Strip	S-16863	Channel 3
	Turret Tuner Strip	S-16864	Channel 4
	Turret Tuner Strip	S-16865	Channel 5
	Turret Tuner Strip	S-16865	Channel 6
	Turret Tuner Strip	S-16865	Channel 7
	Turret Tuner Strip	S-16865	Channel 8
	Turret Tuner Strip	S-16865	Channel 9
	Turret Tuner Strip	S-16865	Channel 10
	Turret Tuner Strip	S-16865	Channel 11
	Turret Tuner Strip	S-16865	Channel 12
	Turret Tuner Strip	S-16865	Channel 13